

Appendix I: Melanesian languages with associations of ‘bone’ with strength

Languages for which existing materials were checked but no relevant associations expressions were found are: Äiwoo, Aghu, Anejoñ, 'Are'are, Arosi, Barupu, Biak, Bunaq, Buru, Cheke Holo, Dani (Lower Grand Valley), Dani (Western), Duna, Eipo, Hatam, Hoava, Iatmul, Imonda, Kamang, Kapauku, Koiari, Koita, Komnzo, Korafe, Kuot, Kwaio, Kwamera, Kwomtari, Kyaka Enga, Lavukaleve, Ma Manda, Marind (Coastal), Mian, Momu, Motuna, Nalögo, Nama, Namia, Naueti, Nen, Nengone, Nimboran, Nungon, Orokolo, Owa, Paluai, Pendau, Rao, Savo-Savo, Sudest, Suena, Suki, Sursurunga, Taijo, Teiwa, Ternate, Toqabaqita, Ujir, Uma, Urin, Wano, Wersing, Yale, Yali, Yawa, Yeri.

Papuan languages

1. Bosavi (iso 639-3: bco, Bosavi, TNG)

Schieffelin & Feld (1998) give *ki* ‘bone’ (e.g., *ki-ma* ‘bone-marrow’) with the following metaphorically-driven colexifications:

- (1) *ki* ‘bone’
- a. *fasi* *ki*
coconut bone
‘coconut shell’
 - b. *ma:n* *ki*
sago bone
‘bark of sago tree (as opposed to soft pith centre)’

Ki ‘bone’ is also associated with strength in the following idiomatic expressions:

- c. *ki-yo:* *halaido:*
bone-? strong
‘strong’
- d. *kalu* *ki* *so:no:*
man bone hit
‘strong, tough man’
- e. *ki-do:ma*
bone-without
‘really weak after illness’
- f. *ki* *halalema*
bone harden
‘exert oneself’

2. Eibela (iso 639-3: ail, Bosavi, TNG)

In Grant (2016), Eibela has *ki:* ‘bone’ (2a) occurs in one expression that involves the association LACK OF BONES IS A LACK OF STRENGTH (2b).

- (2) *ki:* ‘bone’
- a. *φo:se:* *ki:*
back bone

- ‘backbone, spine’
- b. *ki:* *la:* *ma*
 bone exist NEG
 ‘weak’ (lit., ‘bones do not exist’)

3. Fasu (iso 639-3: faa, East Kutubu, TNG)

Loeweke & May (1981) give *kiki* with the meaning ‘bone’, as in (3a). This noun also occurs in one expression that involves the association LACK OF BONES IS A LACK OF STRENGTH:

- (3) *kiki* ‘bone’
- a. *kiki* *takikia* *kua* *kekea*
 bone collect bag put
 ‘The bones were collected and put in a bag.’
- b. *kiki* *fāraka*
 bone finished
 ‘weak, strength gone, cannot walk around’

4. Mauwake (iso 639-3: mhl, Madang, TNG)

In Mauwake (Berghäll 2015), *oona* denotes ‘bone’, as in (4a):

- (4) *oon(a)* ‘bone’
- a. *oona* *kia* *kir-em-ik-eya* *uruf-ap* *ma-e-k*
 bone white turn-SS.SIMUL-be-2/3SG.DS see-SS.SEQ say-PST-3SG
 ‘She saw that the bones were turning white and said, ...’

The nominal compound *mua oona* ‘man bone’ is used to denote ‘man’s strength, strong man’, as in the following examples:

- b. *ona* *mua* *oona* *ook-i-mik*
 3SG.GEN man bone follow-NPST-PRS.1/3PL
 ‘We work according to (each) man’s **strength** (lit., We follow man’s bone(s))’
- c. *Ikoka* *mua* *eliwa* *ne* *mua* *oona* *ika-i-nan*
 later man good and man bone be-NPST-FUT.2PL
 ‘Later you will be a good and **strong** man.’

There are also a range of idiomatic expressions in which *oona* ‘bone’ is associated with strength:

- d. *Yo* *oona* *gorogora-rep* ...
 1SG bone loose-?
 ‘I am tired (from hard work) so ...’ (lit. ‘my bones are loose’)
- e. *oon* *marewag*
 bone have.none
 ‘lazy’ (lit. ‘bones none’)

- f. *Wi oon irap koor uuma fikera*
 3PL bone move.to.and.fro house roof kunai.grass
iiwawun wuepamik.
 altogether put-?
 ‘They **worked strongly** and finished wrapping the kunai grass of the roof.’ (lit., ‘we moved our bones back and forth...’)

5. Aisi (iso 639-3: mmq, Madang, TNG)

Aisi *dagar* ‘bone’ (Don Daniels pers. comm.) appears predicatively meaning ‘strong’ (5a), nominally meaning ‘strength’ (5b) and adnominally meaning ‘strong’ (5c).

(5) *dagar* ‘bone’

- a. *umban narikuŋ dagar ma*
 liver 2PL.POSS bone NEG
 ‘Your wills are not strong.’ (lit. your livers are not bones)
- b. *olgeta samtiŋ andu, ayakayak andu, olgeta dagar*
 all thing 1PL.POSS stuff 1PL.POSS all bone
andu, olgeta mandi iti u-s-uŋ.
 1PL.POSS all COMPL get.SS go-FPST-3PL
 ‘Everything of ours, all our stuff, all our strength, they took it all away.’
- c. *dagar ki*
 bone speech
 ‘strong speech’

6. Usan (iso 639-3: wnu, Madang, TNG)

Ger Reesink (pers. comm.) gives *qer* with the meaning ‘bone’, as in (6a). This noun also occurs in one expression that involves LACK OF BONES IS A LACK OF STRENGTH (6b):

(6) *qer* ‘bone’

- a. *dagar qer*
 side.body bone
 ‘ribs’
- b. *qer ubura*
 bone finished
 ‘be exhausted’

7. Pamosu (iso 639-3: hih, Madang, TNG)

In Tupper (2014), *kenav* ‘bone’ (as in *ane kenav* leg bone ‘lower leg’) appears in metaphorically-driven colexifications such as that in (7a). There is also one adnominal use indicating a association with strength (7b).

(7) *kenav* ‘bone’

- a. *na kenav*
 tree bone
 ‘branch’

- b. *mande unim Filip musim eye isan=ate embe folak=ate*
 person name Philip little DEM up=true SS far=true
waia kenav lolol musim ein oho ke-hat
 wire bone narrow little DEM LOC REM=go.out:3.PST
 ‘That man called “little Philip” walked very high up on that strong, narrow little wire.’

8. Maia (iso 639-3: sks, Madang, TNG)

Weisenburger et al. (2008) gives *-garum* with the meaning ‘bone’, as in (8a). This noun also occurs in one expression showing the association LACK OF BONES IS A LACK OF STRENGTH (8b):

(8) *-garum* ‘bone’

- a. *u-pot u-garum*
 3SG-back 3SG-bone
 ‘his/her back bone’
- b. *i-garum ipuakiweana*
 1SG-bone slack
 ‘I’m tired’ (lit. ‘my bones are slack.’)

9. Kalam (iso 639-3: kmh, Madang, TNG)

Kalam *tji* ‘bone’ (Andrew Pawley pers. comm.) is found in the following idiomatic expressions where it is associated with strength:

(9) *tji* ‘bone’

- a. *tji ay-*
 bone put/form
 (1) ‘be strong, energetic’
 (2) ‘be fierce, aggressive’
- b. *tji kls*
 bone hard/strong
 ‘physically strong and active, energetic’
- c. *tji sayn*
 bone soft/weak
 ‘weak, frail, lethargic’
- d. *tji tmey*
 bone bad
 ‘very strong, very fast (of a person)’
- e. *tji tmey taw-*
 bone bad sell
 ‘sell quickly, be in great demand (of goods)’

10. Kobon (iso 639-3: kpw, Madang, TNG)

In Kobon (Davies 1985 via Andy Pawley pers. comm.), *le* ‘bone’ occurs in the following phrases associated with strength:

- (10) *le* ‘bone’
- a. *le* *l-*
bone put
‘be strong, exert oneself’
- b. *le* *l-ag-*
bone put-NEG
‘be weak’
- c. *le* *mid-ag-*
bone be-NEG
‘be weak’

11. Bena-Bena (iso 639-6: bef, Kainantu–Goroka, TNG)

Carola Emkow (pers. comm.) gives the following Bena-Bena expressions that associate bones with strength:

- (11) *felisa-* ‘bone’
- a. *felisa-a ni'i-ve*
bone-3SG exist:3SG-DECL
‘s/he is strong’ (lit. his/her bone exists)
- b. *felisa-a me ni'i-ve*
bone-3SG NEG exist:3SG-DECL
‘s/he is weak, tired.’ (lit. his/her bone does not exist)

In addition, Young & Young (2006) show that *felisa* ‘bone’ can occur adnominally with the meaning ‘strong’ in a relativisation construction introduced by *ni'ina*, as in (11c).

- c. *felisa ni'i-na nagami'i*
bone exist:3SG-REL water
‘a strong flood’ (lit. bone being water)

12. Kamano (iso 639-6: kbq, Kainantu–Goroka, TNG)

In Kamano (Banala et al. 2005), *zferina* denotes ‘bone’, as in (12a).

- (12) *zferina* ‘bone’
- a. *agemzampa zferina*
chin/jaw bone
‘jaw bone’

This noun is also found in three expressions where it is associated with strength (12b-d).

- b. *nagra zferina-re' neoe*
1SG bone-1SG come:1SG
‘I am strong’ (lit. I have come in my own bone)
- c. *zferina eri avuga ante'nee*
bone ? in.front put
‘make an effort’ (lit. bones put in front)

- d. *zferina omne amne hu'nee*
 bone without just do/say
 ‘feeble, weak, weary, tired’ (lit. do/say entirely without bone)

13. Yagaria (iso 639-3: ygr, Kainantu–Goroka, TNG)

In Yagaria (Renck 1977), *apuva* ~ *ápova* denotes ‘bone’, as in (13a).

- (13) *apuva* ~ *ápova* ‘bone’
 a. *d-apuva d-agavu nokie*
 1SG-bone 1SG-pain strike
 ‘my bones are aching’ (lit., ‘pain is striking my bones’)

This lexeme is also used in the following idiomatic expressions that associate bones with strength of humans:

- b. *d-apuva a'-hane*
 1SG-bone NEG-exist
 ‘I am weak’ (lit. ‘my bones do not exist’)
- c. *l-apuva belesune*
 1PL-bone put/turn.into
 ‘Let us be strong’ (lit. ‘may we turn into bones’)
- d. *d-apova nosue*
 1SG-bone make/speak:PRS.PROG.1SG
 ‘I am strong, zealous’ (lit. ‘I make my bones’)

A further expression *apuva-'ago*, literally ‘without bone’, can be used in reference to inanimates lacking power, as in (13e).

- e. *ganina apuva-'ago*
 lantern bone-without
 ‘lantern lacking power’ (lit. ‘lantern without bone’)

14. Fore (iso 639-3: for, Kainantu–Goroka, TNG)

Scott (1980) provides the following expressions that associate bones with strength in Fore:

- (14) *ayampu* ‘bone’
 a. *n-ayampú piye*
 POSS-bone do:AUX
 ‘feel strong’ (lit., ‘do bones’)
- b. *n-ayampú kampá piye*
 POSS-bone NEG do:AUX
 ‘feel lazy or tired or weak’ (lit. not do bones)

15. Wahgi (iso 639-3: wgi, Chimbu-Wahgi, TNG)

Wahgi (Ramsey 1975) has the lexeme *embelem* for ‘bone’ (15a).

- (15) *embelem* ‘bone’
 a. *nomin embelem*
 neck bone
 ‘bones of the neck’

This lexeme is also documented in three idiomatic expressions associated with strength: *embelem bo-*, literally ‘bone grow’, for ‘to be strong, to be brave’ (15b); *embelem tamb ni- mo-*, literally ‘have soft/weak bones’, for ‘to be a coward’ (15c), and; *embelem e-*, literally ‘to do/make’, for ‘to win (on the basis of strength)’ (15d).

- b. *ope alamb embelem bo-l mim*
 bow.arrow person bone grow-TAM AUX
 ‘The warriors are strong/brave.’
- c. *embelem tamb ni-m yi*
 bone soft/weak AUX-TAM ?
 ‘man who is a coward’¹
- d. *minj alamb embelem e-r monjip*
 Minj person bone do/make-TAM QUANT
 ‘The Minj people won.’

16. Golin (iso 639-3: gvf, Chimbu-Wahgi, TNG)

In Golin (Bunn & Bunn 2009), the lexeme *yóbiláán* ‘bone’ appears in idiomatic expressions associated with strength:

- (16) *yóbiláán* ‘bone’
 a. *yóbiláán bilé-*
 bone mark
 ‘strongheaded, strong personality, stubborn, steadfast’
- b. *yóbiláán bilé niminin mile-*
 bone mark strong be
 ‘become strong, steadfast’
- c. *yóbiláán pai te-*
 bone do give
 ‘give strength to, give respect, honour’

17. Melpa (iso 639-3: med, Chimbu-Wahgi, TNG)

Stewart et al. (2011) give *ompedl* as meaning ‘bone, energy, force, prowess, eagerness, ardour, strength’. Numerous idiomatic expressions in the dictionary attest to the association between bone and strength in Melpa. A few examples are:

- (17) *ompedl* ‘bone’
 a. *ompedl mugli*
 bone exist
 ‘be strong, powerful’

¹ Ramsey (1975) notes that this term is used mostly in describing a man who is unwilling to take risks in battle.

- b. *ompedl* *ou* *iti*
bone big do
'be physically strong and tall'
- c. *ompedl* *munti*
bone become
'act with strength, be full of energy, thirst for action, courage, strength'
- d. *ompedl* *pinti*
bone lay.down
'feel strong, act robustly'
- e. *ompedl* *pi*
bone go
'be eager, energetic, cheerful, daring'
- f. *ompedl* *pek*
bone ?
'be powerful, strong'
- g. *ompedl* *pek* *kara* *ponomen*
bone ? cheeky go:TAM
'be strong in brazenness'
- h. *ompedl* *ōmpidi*
bone hold
'strengthen, fill with vital energy, really take of something, firmly keep to, regard something as the greatest good'

Numerous idiomatic expressions given in the dictionary show that the related association LACK OF BONES IS A LACK OF STRENGTH is also present in Melpa. For instance:

- i. *ompedl* *reimp* *reimp* *ni*
bone soft soft say
'be feeble, weak'
- j. *ompedl* *kel* *mugli*
bone not exist
'be physically weak, not fit'
- k. *ompedl* *ōrem* *ru*
bone replace hit
'get weary, worn out'
- l. *ompedl* *ek* *ni*
bone ? say
'strength dwindling, failing'

The expression *ompedl amporom* 'have bone' is associated with physical and mental strengthening. For instance:

- m. *okka medl edlim e ten wamp ompedl amporom*
 bone thing 3SG ART us people bone have:TAM
 ‘The sweet potato is the real thing that makes us **strong**.’
- n. *min e numan ompedl amporom*
 soul ART mind bone have:TAM
 ‘The soul gives strength to the mind.’

The expression *ik ompedl* ‘bone word’ is used in numerous places in the dictionary to describe resolute speech or opinion. For instance:

- o. *ik ompedl*
 word bone
 ‘firm, unchangeable decision, resolution’
- p. *ik ompedl nenem*
 word bone take
 ‘have firm opinion, express oneself, decide upon’
- q. *ik ompedl ni*
 word bone say
 ‘say decisive word, act strong-willed, advocate something unyieldingly, speak courageously’

18. Kâte (iso 639-3: kmg, Finisterre-Huon, TNG)

In Kâte (Flierl & Strauss 1977), *siec* ‘bone’ (as in, e.g., *qowi siec* ‘animal bone’) has the following metaphorically-driven colexifications in nominal compounds:

- (18) *siec* ‘bone’
- a. *worâŋ siec*
 mango bone
 ‘mango stone’
- b. *hâmu siec*
 coconut bone
 ‘coconut shell’
- c. *fic siec*
 house bone
 ‘framework of a building’
- d. *jâc siec*
 tree bone
 ‘poles for a wooden structure, poles for the structure of a bush house’

Conventionalised expressions that associate *siec* with strength:

- e. *siec wânzâŋ*
 bone ferocious
 ‘violent’ (lit. ferocious bones)

- f. *ɲic* *siec* *wânʒân*
 human bone ferocious
 'energetic worker' (lit. person (with) ferocious bones)
- g. *siec-ne* *herâ* *rokicnec*
 bone-POSS ? remove
 'he is unfit, unqualified' (lit. his bones have been removed)
- h. *siec* *dodoc* *ecnezo*
 bone weak inflict
 'be tired' (lit. inflict weak bones)
- i. *siec* *tara*
 bone fall.off
 'undecided' (lit. bones fall off)
- j. *ɲic* *siec* *wauc*
 human bone loose
 'weak, unstable person' (lit. person (with) loose bones)

19. Selepet (iso 639-3: spl, Finisterre-Huon, TNG)

McElhanon & McElhanon (1970) has *tân* meaning 'bone' (e.g., *gasum tân-ɲe* side bone-3SG 'rib') with the following metaphorically-driven colexifications in nominal compounds:

- (19) *tân* 'bone'
- a. *emet* *tân-ɲe*
 house bone -3SG
 'frame for house'
- b. *manam* *tân-ɲe*
 banana bone-3SG
 'prop, support for a banana tree'

Tân 'bone' is also associated with strength in the following expressions:²

- c. *tân-yeɲe* *hâuɲ* *yap*
 bone -3PL wilt AUX
 'They are tired' (lit., 'their bones wilt')
- d. *tân-yeɲe* *hâlâlân* *yap*
 bone-3PL dry.out AUX
 'They are fatigued' (lit., 'their bones dry out')

² The Selepet dictionary lists many more items with *tân*, but because I am unsure of their compositionality I have not included them: e.g., *tân-gu* bone-VBLZ 'to help him'; *tân-ɲi-âk* bone-only with 'empty stalk, thin'; *lok tân-ɲi-âk* *tân-ɲi-âk* 'heavy set, stocky man'; *aman tân hutuk kutuk* 'to sleep deeply'; *tân yap* 'to be stocky'; *tân tân yap* 'to swell up, to become full bodied, big'.

- e. *tân-e hutuk yap*
bone -1SG quiet AUX
(1) ‘I am weary’ (2) ‘I am amused’ (*rare*)³
- f. *tân- tiŋ~tiŋ yap*
bone be.tight AUX
‘to gain strength (of new born), to develop’
- g. *lok tân-ŋiak tân-ŋiak*⁴
man bone-with bone-with
‘heavy set man’
- h. *tân yap*⁵
bone AUX
‘to be stocky’

20. Kewa (iso 639-3: kew, Greater Engan, TNG)

In (Franklin et al. 2014), Kewa *uni* ‘bone’ (as in, e.g., *mena uni* ‘pig bone’) appears in three idiomatic expressions where it is associated with strength:

- (20) *uni* ‘bone’
- a. *neme nina uni agaa mea-pa?*
1SG.ERG 1SG.POSS bone talk get-QUESTION
‘Do you question how strong I am?’
- b. *uni oma paya*
bone die make:3SG.PRF
‘weak person’ (lit. bone made dead)
- c. *uni kogorea*
bone cold
‘someone about to die’ (lit. cold bones)

21. Baruya (iso 639-3: byr, Angan, TNG)

In Baruya (Lloyd 1992) the lexeme *yagin(ya)* ‘bone’ (as in, e.g., *gile-yaginya* corpse-bone ‘skeleton (of a dead person)’) has the following metaphorically-driven colexifications in nominal compounds:

- (21) *yaginya* ‘bone’
- a. *taiparo-yaginya*
plant-bone
‘stalk of a plant’

³ More common with this meaning is *tân hutuk hutuk-ŋe* ‘amusement’

⁴ Without the reduplication *tân-ŋiak* bone-with has a range of meanings based a different association including ‘empty-handed, empty stalks, thin’.

⁵ Reduplication of *tân* in this construction is only used of fruit and trees: *tân tân yap* bone bone AUX (1) ‘to become full bodied (of fruit)’, (2) ‘to swell up, grow big (of trees)’

- b. *ang-il-yaginya*
house-up-bone
'roof frame without grass'
- c. *kwaari'ma-yaginya*
knife-bone
'iron, metal'
- d. *mwar-yaginya*
arrow-bone
'bow'

Baruya has numerous idioms associating *yaginya* with strength, but it appears to be limited to human strength⁶:

- e. *yagin-nakai*
bone-have:3SG
'strong man'
- f. *a'mwa-yaginya-i*
person-bone-have
'strong fighter'
- g. *yagi~yagi-wawinya* *yadelyiro*
3RDP~bone-work do:3SG
'He works hard, is zealous, is industrious.'
- h. *yagi-maaya-i*
bone-without-have
'man who is not a strong gardener'
- i. *yagi-wirita*
bone-weak
'weak from sickness'

22. Angave (iso 639-3: aak, Angan, TNG)

In Angave (Speece 2006) the lexeme *enji'* can be used to denote 'bone' (22a), 'skeleton' (22b), 'thorn'(22c), and 'trunk' (22d).

- (22) *enji'* 'bone'
- a. *xopi'* *enji'* *ipiniṅini*
bat bone wear.around.neck:1SG.TAM
'I'm wearing a necklace of bat **bones**.'
 - b. *sa enji'-ni* *siṅwi'* *niwiniro*
3 bone-POSS eye see:3PL.TAM
'They saw just **skeletons**.'

⁶ There was several unanalysed expressions where *yaginya* is clearly an element and strength (or lack thereof) is being an expressed, e.g., *yagi-ngaala'nai* 'weak', *kwar-yaginya* 'hard / strong'.

- c. *soxi'* ***eji'*** *r-iki'piji'rani?*
 cane bone 2SG-scratch:3SG.TAM
 'Did a cane **thorn** scratch you?'
- d. *ipi'* ***eji'*** *ni-dikiri* *xegi'* *o'i'* *ni-xerane*
 sago bone 1PL-cut.length 3.own hole 1PL-dug.out.pith
 'We sectioned the sago **trunk** and dug out its pith.'

Eji' is also used in the following expressions in which bone is associated with strength:

- e. *gi' ari'o* *sini* ***eji'*** *mearini*
 my grandfather still bone raise
 'My grandpa still has **strength** (for working).'
- f. *o* ***eji'*** *ea'niḡorini*
 he bone fellow
 'He's a **strong** fellow.'
- g. ***eji'*** *peḡoxirani'?*
 bone die.off:3SG.TAM
 'Has your **strength** died?'
- h. ***eji'*** *mi'niḡi'* *reḡini'?*
 bone ? ?
 'Are you weak?'
- i. ***eji'*** *apearini*
 bone crawl
 'weak'

23. Telefol (iso 639-3: tlf, Greater Ok, TNG)

In Healey & Healey (1977), Telefol *kún* 'bone' has a few metaphorical-driven colexifications in nominal compounds:

- (23) *kún* 'bone'
- a. *túl-kún*
 leg-bone
 'lower leg bone (of animal or human)'
- b. *am* *kún*
 house plant
 'house post/stump, wall-stud'
- c. *múk* *kún*
 earth bone
 'mound, hillock'
- d. *níng* *kún*
 jew's harp bone
 'reed of a jew's harp'

Kún is also used in the following expressions that are underpinned by a lexico-semantic association of bone with strength:

- e. *kún* *tébe-sú*
bone become-TAM
(1) ‘strong, firm, hard’
(2) ‘(of a person) has authority/power’
- f. *kún* *bígí*
bone break
‘be strong, brave, fearless’
- g. *kún* *kúp* *bígím-in*
bone give break-TAM
‘hard work’
- h. *kún* *ku-lúga-em-in,* *ku-lúb-e*
bone 3PL-get-3SG-TAM 3PL-?-?
‘beat/defeat (him)’
- i. *kún* *kwaa-em-in*
bone throw-3SG-TAM
‘beat/defeat (him)’
- j. *kún* *fing(ó)gam-in*
bone rest-TAM
‘have/take a rest/holiday’
- k. *öm* *kún* *kúp* *tebé-sá*
husk bone give become-TAM
‘have stamina (of tough meat, long winded escaping pig, hard-working man)’

24. Oksapmin (iso-639-3: *opm*, Greater Ok, TNG)

Lawrence (2006) gives *tam* with the meaning ‘bone’ in Oksapmin. This noun also occurs in two idioms expressing LACK OF BONES IS A LACK OF STRENGTH:

- (24) *tam* ‘bone’
- a. *tam* *taperpät*
bone fall.out
(1) ‘exhausted from hard work’
(2) ‘be overwhelmed by a sight’ (lit. bones fall out)
- b. *tam* *tap-e*
bone die-TAM
‘lazy’ (lit. bones dead)

25. Ekari (iso 639-3: *ekg*, Paniai Lakes, TNG)

In Ekari (Steltenpool 1969), *mitoo* denotes ‘bone’ in compounds with body parts (25a), but refers to strength when compounded with *me*: (25b):

- (25) **mitoo** ‘bone’
- a. *boko mitoo*
breast bone
‘breast bone’
- b. **mitoo me:**
bone man
‘strong man’ (lit. bone man)

26. Central Asmat (iso 639-3: cns, Asmat-Kamoro, TNG)

In Central Asmat (Roesler 2011), *emak(e)* denotes ‘bone’ in compounds with body parts (26a).

- (26) **emak(e)** ‘bone’
- a. *e emake*
thigh bone
‘thigh bone’

Emak(e) is also associated with strength in the expressions, *emake awut* ‘big bones’ (26b) and *nam emake* ‘give bone’ (26c).

- b. *Ay ow dam emake awut.*
friend people body bone big
‘Young people are strong.’
- c. *Tuhan Allah nam emake atitamforow.*
Lord God 3SG:give bone to.us
‘God gave us bones (therefore we should work).’

27. Managalasi (iso 639-3: mcq, Koiari, TNG)

In Managalasi (Parlier & Parlier 1981), the lexeme *ata* is glossed ‘bone, stem’. An example of its use is given in (27a). It also appears in two idiomatic expressions associated with strength: *ata kaisina*, literally ‘bone hard’, for ‘powerful, having great muscular strength/strong’ (27b) and ‘strong-willed, determined’ (27c), and; *ata paranio*, literally ‘use bone’, for ‘exhausting, wearing, to be tired’ (27d).

- (27) **ata** ‘bone’
- a. *ua karo hanuh-ata apena va'ana*
dog DEM animal-bone take go:TAM
‘That dog took the bone and went.’
- b. *hu ata kaisin-ijihuna'e...*
3SG bone hard-TAM
‘He’s a strong person and...’
- c. *hu ata kaisina-'omo...*
3SG bone hard-CONJ
‘He’s determined to...’
- d. *na hareha ajima va'uja-ho ata paran-iuna*
1SG hill ascend go-CONJ bone use-TAM
‘Whenever I climb hills, I get exhausted.’

28. Daga (iso 639-3: dgz, Dagan)

In Daga (Murane 1974, Murane & Murane 2007), *kaim-* denotes ‘bone’ (28a), ‘tooth’ (28b), ‘shell’ (28c), and ‘frame’ (28d).

(28) *kaim-* ‘bone’

- a. *pusi kaim-ewa*
leg bone-3SG
‘bone of the leg’
- b. *no kaim-ewa*
mouth/lip bone-3SG
‘front tooth, incisor’
- c. *dogit kaim-ewa*
mussel bone-3SG
‘mussel shell’
- d. *didi kaim-ewa*
wall bone-3SG
‘wood in frame of house, studs’

In Daga, ‘hard’ is expressed through derivation of *kaim-* ‘bone’ with the suffix *-ake* ‘ADJ’, as in (28e) and (28f). *Kaim-ake* is used in idiomatic expressions with the noun *imua* ‘will’ as in (28g) and (28h).

- e. *kaim-ake uon*
bone-ADJ NEG
‘not hard, soft’
- f. *ameme oma da itani den kaim-ake den*
DEM wood one heavy with bone-ADJ with
‘that one heavy hard wood (a description of a safe)’
- g. *imua kaim-ake tan*
will bone-ADJ do:3PL
‘strong-willed’
- h. *imua kaim-ake wan*
will bone-ADJ say:3PL
‘unmerciful, unloving’

Kaim- ‘bone’ is also the base from which the adverb *kaim-akaet* bone-ADV meaning ‘zealously, earnestly’ is derived, as used in (28i).

- i. *kaim-akaet wapen*
bone-ADV say
‘to speak sternly’

29. Mende (iso 639-3: sim, Sepik)

In Mende (Nozawa 2006), *hava* denotes ‘bone’ in compounds with body parts and animals (29a), but has several metaphorically driven associations in compounds with inanimates (29b-c):

- (29) *hava* ‘bone’
- a. *fle* *hava*
pig bone
‘pig bone’
 - b. *kumbia* *hava*
mango bone
‘mango stone’
 - c. *tla* *hava*
pandanus bone
‘pandanus seed’

Mende also has the following idiomatic expressions that associate bones with strength:⁷

- d. *hava* *longo-nda* *ma*
bone pull-TAM NEG
‘who doesn’t have strength’ (lit. does not pull bones)
- e. *wako* *shir* *lerawu* *hava* *kava* *mende-n* *la-nda* *shir-a*
yes DU work bone bad very-OBJ do-HAB DU-INT
‘Yes, you two are hard working.’

30. Kwoma (iso 639-3: kmo, Sepik)

In Kwoma (Bowden 1997), the lexeme *hapa* has a few metonymy-driven lexical associations, ‘bone’ (30a), ‘bone of the upper arm’ (30b) and ‘upper arm’ (30c):

- (30) *hapa* ‘bone’
- a. *apo* *hapa*
bird bone
‘dried bird bones (i.e. bones that have no flesh or feathers attached)’
 - b. *nedii* *hapa*
middle bone
‘bicep’
 - c. *hapa* *biirajii*
bone muscle
‘muscle and flesh of upper arm’

In Kwoma, ‘strong’ is expressed through *hapa* derived using the suffix *-ga*, which attaches to nouns to express similitivity:

- d. *eyi* *me* *sa* *hapa-ga* *tao*
paddle wood must bone-like be
‘Wood for paddles must be **strong**’

⁷ Mende has an adverb *havahavarika(k)* ‘strongly, sternly’ that is likely based on *hava* ‘bone’, e.g., *havahavarikak* or *pawa ri* ‘He forbade him very **strongly**’, and *havahavarika mendek or pari* ‘He said very **sternly**’.

- e. *diita me hapa-ga tawa*
 this wood bone-like is
 ‘This wood is **hard**’
- f. *sokwa-chi hapa-ga siir*
 rise-? bone-like become
 ‘(he) became **strong**’

Hapa-ga is also found in two idiomatic expressions showing an association to authority and power:

- g. *maji hapa-ga*
 word bone-like
 ‘a factually correct, morally acceptable, or authoritative statement’
- h. *tapa hapa-ga*
 word bone-like
 ‘powerful hand (of sorcerers)’⁸

While ‘strong’ in general is expressed with *hapa-ga*, a conventionalised expression using *hapa* also exists to denote males of great strength:

- i. *kata ma rii kwochobo hapa mayaka-ka tawa*
 that person 3SG.M thigh bone large-with be
 ‘That man is immensely strong.’ (lit., ‘he is with large thigh bone’)

31. Mehek (iso 639-3: nux, Sepik)

In Mehek (Hatfield 2016), *yefa* denotes ‘bone’ as in (31a). The noun also appears in two expressions where the having of bones is associated with strength, as set out in (31b-c).

(31) *yefa* ‘bone’

- a. *yefa=m o-m-ra su noko ra=ka*
 bone=PL DIST-PL-EMPH 3SG.F gather get=REAL
 ‘She gathered those bones.’
- b. *yefa kana*
 bone with
 ‘strong’ (lit. (be) with bone)
- c. *yefa timba*
 bone empty
 ‘weak’ (lit. (have) empty bones)

⁸ According to Bowden (1997), this is used “for sorcerers whose exceptional knowledge of sorcery techniques enables them to manipulate sorcery substances more effectively than others.”

32. Ambulas (iso 639-3: abt, Sepik)

In Ambulas (Wilson 2008), *apa* refers to ‘bone’ in reference to human and animal body parts, as in (32a). When referring to parts of plants, *apa* has metaphorically-driven associations, such as those in (32b-c).⁹

(32) *apa* ‘bone’

- a. *apa dé tékwiyaak*
bone 3SG broken-PST
‘The **bone** is broken’
- b. *awuré yévét apa-ba*
up tree.sp bone-LOC
‘up on the yevet tree **trunk**’
- c. *laaknyény apa sékaaki-ye de waapi kubu-ba léki-yu*
ginger bone crush-? they yam yam.head-LOC tie-?
‘They crush the ginger **stalks** and tie them at the head of the yam’

Predicatively, *apa* can either stand alone as in (32d) or occur with do-support ‘bone’ (32e), where it is translated with ‘strong’:

- d. *wani nyéga apa yamarék yate dé nyéknwu*
DEM leaf bone NEG and 3SG go.slack:3
‘That leaf is not **strong** and goes slack’
- e. *apa méné y-o*
bone you do-PRS
‘you are **strong**’

Apa is also used adnominally to nouns with human referents where it has a range of meanings connected by the BONES ARE STRENGTH association. Some of these are illustrated in (32f-h) modifying the noun *du* ‘man’. Where *apa* appears in a relative clause modifying *du*, reference is physical strength. This is confirmed by *apa yakwa du* being the translation consistently used for reference to physically strong men in bible passages such as Matthew 12:29, Mark 3:27, and Luke 11:21. By contrast, when *apa* is not placed in a relative clause, its adnominal meaning with *du* does not appear to refer to physical strength, but rather to physical size and movement into maturity as the examples in (32g-h) suggest.¹⁰

- f. *apa yakwa du*
bone REL man
‘strong man, man who is strong’

⁹ The same form, *apa*, seems to be involved in several other unanalysable forms with adjectival meanings: *apakélé* ‘big, great’, *tirapa* ‘big, strong, hard’. Although the historical formation of these items is not understood, a connection seems likely.

¹⁰ This is reminiscent of the ‘hardening’ which Schieffelin (1990) identifies among the Bosavi as characterising the process of maturation into adulthood.

- g. *Jisas apa du yadéka ...*
 Jesus bone man and
 ‘Jesus increased in wisdom and stature...’ (lit. Jesus was a bone man and...)¹¹
- h. *apa du ya-guné-kwa-ba, t-e, t-e, yaga pulak*
 bone man do-2PL-APR-because stand-R1 stand-R what like
ya-ké guné y-o
 do-INT 2PL do-PRS
 ‘Since you are **adult**, if you just remain (idle), then how will you manage?’

When used adnominally to nouns with inanimate referents, *apa* has a wide range of possible translations:

- i. *apa yakwa kadému nébi-t wuné sagule k-o*
 bone REL food tooth-1SG 1SG bite consume-PRS
 ‘I bite **hard** food with my teeth and then I eat it’
- j. *apa maas viyaa-dék dé taabun-ba paaku-k*
 bone rain hit-? 3SG overhang-LOC shelter-?
 ‘**Heavy** rain fell so he took shelter under the roof overhang’
- k. *ken apa jebaa naane ya-k*
 FOC bone work we do-PST
 ‘This is **big** work that we do’
- l. *bulaa kén apa yéwa-at de kérao*
 now FOC bone money-with 3PL buy
 ‘Now it is with **much** money that they buy (them)’

33. Manambu (iso 639-3: mle, Sepik)

In Manambu (Aikhenvald 2008), *ap* ‘bone’ is used with the verb *tə* ‘have’ to mean ‘be strong’, both in adnominal (33a) and predicative contexts (33b).

- (33) *ap* ‘bone’
- a. *samasam-a ap tə-na-d-ə mi*
 lot-LINK bone have-ACT.FOC-3M.SG.BAS.VT-LINK wood
 ‘very hard wood’.
- b. *ap ma: tə*
 bone NEG have
 (1) ‘have no bones’ (of a fish)
 (2) ‘be soft (of a piece of wood)’
 (3) ‘be weak or meek’ (of a person)’

An extension of the association with strength to what Aikhenvald (2008) terms ‘resistance’ may be present in the following idiomatic expressions in Manambu:

¹¹ This example presents the Ambulas translation of the first clause of Luke 2:52. Commentators agree that the original Greek ἡλικία ‘stature’ does not refer to age, but to growth, bodily size, i.e., Jesus coming into adulthood.

- c. *wun-a* *ya:l* **ap** *taka-na*
 1-LINK.SG.F belly bone put-ACT.FOC.3F.SG.BAS.VT
 ‘I have no appetite’. (lit. my belly puts bone)
- d. **ap** *krapə-na-wun*
 bone lift-ACT.FOC-1F.BAS.VT
 ‘I put up (with something)’

34. Tayap (iso 639-3: gpn, isolate)

Kulick & Terrill (2019) give *ning* ‘bone’ and identify one expression associating bone with strength (34):

- (34) **ning** ‘bone’
Yu **ning-ŋa-ke** *amuga-r?*
 2SG bone-POSS-QUESTION fight-NFINAL
 ‘Are you strong enough to fight?’ (lit. ‘do you have the bones to fight?’)

35. Ulwa (iso 639-3: yla, Ulmapo)

Barlow (2018) gives *uma* with the meaning ‘bone, fish hook’ in Ulwa. This noun also occurs in one expression that involves an association with strength:

- (35) **uma** ‘bone’
uma *tī*
 bone take
 ‘be strong’

36. Kamasau (iso 639-3: kms, Torricelli)

In Kamasau (Sanders & Sanders 2015), **ngape** denotes ‘bone’, as illustrated in (36a). The idiomatic expression *ngape riti* (bone die) has the meaning ‘be weak’ in Kamasau. The expression is used in reference to a person’s legs in (36b) to denote paralysation.

- (36) **ngape** ‘bone’
- a. *duagi* *ni* **ngape** *gre* *ayene*
 cassowary 3 bone strong very
 ‘The bones of the cassowary are very **strong**.’
- b. *ni* *nyinge* **ngape** *riti* *bu* *nyinge* *nare* *kin* *tuqui* *segi*
 3 leg bone dead so leg own able NEG
 ‘His legs were paralysed (lit., **bone dead**) so he couldn’t walk.’

37. Kombio (iso 639-3: xbi, Torricelli)

Kombio (Farr 2019) *linkepm* ~ *lenkepm* denotes ‘bone’ (37a) and ‘shell’ (37b).

- (37) **linkepm** ~ **lenkepm** ‘bone’
- a. **linkepm** *urienk*
 bone side
 ‘rib’

- b. *womp linkepm*
 coconut bone
 ‘hard shell of the coconut’

The association between bone and strength in Kombio is seen in two lexically restricted constructions. In (37c), *mulum(u)lai* combines with *linkepm* ~ *lenkepm* ‘bone’ to denote ‘very weak’; it is otherwise only known to occur in the combination with *mplielmplul mulum(u)lai* where it is used “to emphasize [that the subject is] very weak, [has] absolutely no strength” (Farr 2019: 115). The construction with *nturnter* (37d) is even more restricted in that *nturnter* is not known to have any use independent of *linkepm* ~ *lenkepm* ‘bone’.

- c. *linkepm mulumulai*
 bone very.weak
 ‘very weak’
- d. *linkepm nturnter*
 bone ?
 ‘extremely tired, exhausted’

38. Waris (iso 639-3: wrs, Border)

In Waris (Brown 1990, Brown et al. 2017), *kél* denotes bone, as illustrated in (38a). The expression *kél wosapr-* (bone plant) has the meaning ‘give strength’ in Waris (38b).

- (38) *kél* ‘bone’
- a. *yuh-kél*
 hip-bone
 ‘pelvis’
- b. *hi-mba pró-na ye-na-m kél-m wosapr-in-ilm*
 3-TOP come-PST 2-GEN-GL bone-GL plant-BEN.PL-TEL
 ‘He came in order to give you **strength**.’

39. Sentani (iso 639-3: set, Sentanic)

In Sentani *bo* has the meaning ‘bone’ as illustrated in (39a). This derives by reduplication the form *bo~bo* REDUP~bone which is translated variously as ‘hard’ ‘firm’ or ‘strong’. The two textual examples of *bo~bo* that I have found are illustrated in (39b-c).

- (39) *bo* ‘bone’
- a. *kha bo eheraiyeije*
 fish bone drop:NEG
 ‘Don’t drop the fish bone anywhere.’ (Deda 2018)
- b. *nuwa bo~bo*
 body:3SG REDUP~bone
 ‘His body is firm.’ (Fautngil et al. 1999)
- c. *khenā bo~bo hele khoye*
 principle REDUP~bone 3SG has
 ‘He has a firm principle.’ (Deda 2018)

40. Mekwei (iso 639-3: msf, Nimboran)

In Mekwei *den* has the meaning ‘bone’ as illustrated in (40a). This form is also used to express ‘strong at working’ (original Indonesian ‘kuat tentang tenaga’, Iribaram 2017 et al.: 17), as illustrated in (40b). A reduplicated form *den~den* REDUP~bone is also variously as ‘strong’, as in (40c).

- (40) *den* ‘bone’
- a. *mbiok den*
pig bone
‘pig bone’
- b. *ai kembali den katuei*
father work bone much
‘Father works very hard.’
- c. *nggo donak den~den*
that child REDUP~bone
‘That child is strong.’ (Iribaram 2017 et al.: 17)

41. Kemtuik (iso 639-3: kmt, Nimboran)

In Kemtuik (van der Wilden et al. nd.), *don* denotes ‘bone’, as in (41a). The expression *don kok* (bone put in) has the meaning ‘get/have strength’ in Kemtuik (41b).

- (41) *don* ‘bone’
- a. *nebo don*
pig bone
‘pig bone’
- b. *don kok genang, keballi kangok so se semu*
bone put.in purpose work big ? must do
‘In order to get strong, (I) must work hard.’

42. Ngkolmpu (iso 639-3: kcd, Morehead)

In Ngkolmpu (Matthew Carroll pers. comm.), *mpar* denotes ‘bone’, as in (42a). The root *mpar* also appears as an adjective derived with the productive adjectiviser *-wa* (42b), with meanings consistent with the BONES ARE STRENGTH association found elsewhere in New Guinea.

- (42) *mpar* ‘bone’
- a. *tgu mpar*
leg bone
‘leg bone’
- b. *mpar-wa*
bone-ADJ
‘hard, firm, solid’

43. Meyah (iso 639-3: mej, East Bird’s Head)

In Meyah (Gravelle 2004), *oforá* denotes ‘bone’, as in (43a). Like many other body-part nouns, it also occurs in idiomatic expressions for emotions and personal characteristics. In (43b-d) we see that expressions with *oforá* relate to strength and weakness.

- (43) **oforá** ‘bone’
- a. *rua ri-ofra oforá keuma*
 they 3PL-lift bone DEM
 ‘They carried those bones.’
- b. **oforá efék**
 bone strong
 ‘be strong, persistent, stubborn’
- c. **oforá eriaga**
 bone weak
 ‘be weak, feeble’
- d. **oforá ekeni**
 bone red
 ‘be bold’

In (43e-f) Meyah *oforá* also occurs in idiomatic expressions relating to effort:

- e. *éij oforá efék*
 throw bone hard
 ‘endeavour’
- f. **oforá enckij**
 bone capable
 ‘capable, afford’

44. Moskona (iso 639-3: mtj, East Bird’s Head)

In Moskona (Gravelle 2010), *oforna* denotes ‘bone’, as in (44a). Like its close relative Meyah, *oforna* occur in idiomatic expressions consisting of a bodypart noun and a predicate that are associated with strength and weakness, as in (44b-d).

- (44) **oforna** ‘bone’
- a. *ejmeg oforna*
 spine bone
 ‘back bone’
- b. **oforna ahaysa**
 bone hard
 ‘be invulnerable’
- c. **oforna owas**
 bone strong
 ‘be adversarial’
- d. **oforna egerag**
 bone weak
 ‘be lethargic’

45. Maybrat (iso 639-3: ayz, West Papuan)

In Maybrat, *-tai* is glossed as ‘bone’, ‘strong’ (Dol 2007) as well as ‘to be able, capable, to afford’ (Kafiar et al. 1989). Textual examples of this root’s use are limited, but make clear the lexical association between bones and strength is present in Maybrat:

- (45) *-tai* ‘bone’
- a. *t-tai*
1SG-bone
‘my bone’ (Dol 2007)
- b. *ait* *y-tai* *y-kah* *bo* *fee*
3.M 3.M-bone 3.M-with AUX NEG
‘He has no energy to work’ (NA 2004) (lit. He is not with bone)
- c. *ait* *haberek* *ye* *y-tai* *mboh*
3.M turn and 3.M-bone white
‘He needs to rest much (and) he looks very pale (lit. ... his bones are white)’ (NA 2004)
- d. *n-tai* *fe*
3-bone NEG
‘unable, incapable’ (Kafiar et al 1989)

46. Rotokas (iso 639-3: roo, North Bougainville)

In Rotokas (Firchow & Firchow 2008), the root *keru-* is glossed as ‘bone’ with nominal morphology (46a) and ‘hard as bone’ with verbal morphology (46b).

- (46) *keru-* ‘bone’
- a. *keru-a*
bone-N
‘bone’
- b. *semen* *keru-o-vere*
cement bone-3SG.F-NFUT
‘The cement will become hard as bone.’

There is also a derivation of the root listed that fits within the BONES ARE STRENGTH association: *keru-ria* glossed as ‘persistent, stubborn, determined’ among other things (46c-f).

- c. *keru-ria-pa-ro-i* *ava arapa*
bone-?-CONT-3SG.M-PRS go not
‘He is determined not to go.’
- d. *keru-ria* *vovo-u-to*
bone-? man-?-3SG.M
‘stubborn person, man with strong personality’
- e. *keru-ria-vira*
bone-?-ADV
‘persistently, obstinantly’

- f. *keru-ria reo-to*
bone-? talk-3SG.M
'persuasive talker'

47. Buin (iso 639-3: buo, South Bouganville)

Laycock (2003) gives Buin *kaana* as 'bone', as in (47a). The possessive predication suffix *-raaka* occurs on *kaana* to denote 'strong' for animates (47b). The idiomatic expression in (47c) reinforces the association between bones and strength in Buin.

- (47) *kaana* 'bone'
- a. *iiananke kaana*
fish bone
'fish bone'
- b. *kaana-raake*
bone-HAVE
'strong (of human, animal)' (lit. have bone)
- c. *kaana tounoke teumoi*
bone nothing be
(1) 'boneless (of meat)'
(2) 'weak (of person)' (lit. bone be nothing)

48. Bilua (iso 639-3: blb, isolate)

Bilua *piza* is given in Obata (2003) with the meaning 'bone', as in the following:

- (48) *piza* 'bone'
- a. ... *se=ko maba=mu=ko piza se ta*
3PL=3SG.F person=PL=3SG.F bone 3PL TOP
ke=k=e=ake sole
3PL=3SG.F.OBJ=see=HIST because
'... because they saw their people's bones'

Piza is also used adnominally where it indicates strength in humans. This is illustrated in the following examples:

- b. *Sito ta matu piza=ka=la maba*
Sito TOP very bone=LIG=3SG.M person
'Sito was a very strong person'
- c. *piza=ka=la Volosi*
bone=LIG=3SG.M Volosi
'very strong Volosi'

The glosses 'bone, strong' for *piza* are also found in the anonymous Bilua dictionary (NA 1960), alongside derived forms *piza-to* 'strength' and *piza-reqere* 'a person in decline'.

Austronesian languages

49. Sinaugoro (iso 639-3: snc, Papuan Tip linkage)

Tauberschmidt (1995) gives Sinaugoro *turiya* with the glosses ‘bone’ and ‘strong’. The meaning ‘bone’ is illustrated in (49a), while the meaning ‘strong’ is expressed by means of *ma turiya-* ‘(be) with bones’, as in (49b).

- (49) *turiya* ‘bone’
- a. *bai, mayani e tarima turiya-ri*
pig wallaby and people bone-3PL
‘bones of pigs, wallabies and people’
- b. *maitau tu ma turiya-na*
DEM man with bone-3SG
‘This is a strong man’ (lit. this man is with his bones)

50. Motu (iso 639-3: meu, Papuan Tip linkage)

Lawes (1896) gives Motu *turia* with the gloss ‘bone’ (50a). A reduplicated form of *turia* is used as an adverb denoting that an action is done ‘energetically’ (50b).

- (50) *turia* ‘bone’
- a. *turia rudu*
bone side.chest
‘rib’
- b. *turia~turia*
REDUP~bone
‘energetically’

51. Jabêm (iso 639-3: jae, North New Guinea Linkage)

In Jabêm (Streicher 1982), *têkwa* is given with the meaning ‘bone’ (51a) in reference to body parts, and has a range of metaphorically-driven colexifications when used in reference to inanimates (e.g., 51b-c).

- (51) *têkwa* ‘bone’
- a. *gêsù têkwa*
neck bone
‘neck, nape of neck, vertebrae of the neck’
- b. *bêlêm ña-têkwa*
wire POSS-bone
‘barbed wire’
- c. *ka-têkwa*
wood-bone
‘canoe angle-ribs’

Jabêm also has the following idiomatic expressions of the form *têkwa* + predicate that associate bones with strength (51d-e) and a lack thereof with weakness (51f-g). As in other languages with this association, we also find the WORKING HARD IS USING ONE’S BONES (51h).

- d. *têkwa* *saki*
bone active
'be/feel strong, energetic, active, bold, frisky, enterprising, lively, untiring, enduring'
- e. *têkwa* *kêsa*
bone come.out
'be/feel energetic, refreshed, strengthened, vigorous, recuperated, eager'
- f. *têkwa* *gêbac*
bone finished
'be/feel tired, exhausted'
- g. *ɲa-têkwa* *gali*
POSS-bone soft
'weak bones, undeveloped, half-grown'
- h. *taêm* *ɲa-têkwa* *su*
1PL POSS-bone waste
'we work hard/strenuously' (lit. we waste our bones)

Têkwa is also attested adnominally in a few expressions where it denotes 'strong' (51i-j):

- i. *ɲac-têkwa*
man-bone
'a strong man, brave hero, a courageous man'
- j. *ɲac* *ɲa-têkwa* *teŋ*
man POSS-bone someone
'a strong man'
- k. *daun* *ɲa-têkwa*
smoke POSS-bone
'good, strong tobacco'

52. Buang (iso 639-3: bzh, North New Guinea Linkage)

In Hooley et al. (2010), Buang *seḵë* is glossed 'bone, forearm, framework, supporting structure, building materials.' This noun also appears in several idiomatic expressions that involve the association LACK OF BONES IS A LACK OF STRENGTH: *seḵë ma* 'weak' (52a), *seḵë pehuhek* 'exhausted, tired, weak, lazy' (50b), and *seḵë pering* 'lazy, paralysed' (52c).

(52) *seḵë* 'bone'

- a. *seḵe* *ma* *gesu* *nevong* *huk* *re*
bone NEG.EXIST and 3SG work NEG
'He has no strength and isn't working.'
- b. *kil* *seḵe-d* *pehuhek*¹²
1PL.INCL bone-1PL.INCL ?
'We are tired out.'

¹² This item does not have a separate entry in the Buang dictionary and appears to be only used in conjunction with 'bone'.

- c. *luho seke-j pering ...*
 3DU bone-3PL lazy
 ‘The two of them are lazy...’

The metonymy-driven colexification of ‘bone, forearm’ displayed by *seke* appears to be play into the meanings assigned to the following idiomatic expressions that are also related to strength: *seke ading*, literally ‘bone/forearm long’, for ‘strong, able to throw a long way’; *seke dus*, literally ‘bone/forearm short’, for ‘weak, unable to throw very far’, and; *seke beginek*, literally ‘bone/forearm snake type’ for ‘lazy, a person who won’t work, a person who has a deformed arm’.

53. Bola (iso 639-3: bnp, Meso-Melanesian)

In Bola (Bola bible translations via René van der Berg pers. comm.), *tuha* ‘bone’ can be marked with the suffix *-ka* to create a modifier ‘strong’. This can be used as a predicate (53a), as an adnominal modifier (53b), in a relative clause (53c), and as an adverb (53d).

(53) *tuha* ‘bone’

- a. *ga bole ranga maki moto kani, moto tuha-ka,...*
 1SG.IRR get/take PL thing 2PL eat 2PL bone-ADJ
 ‘I will get some food and you will eat, and you will be strong, ...’ (Genesis 18:5)
- b. *a bakovi tuha-ka*
 ART man bone-ADJ
 ‘a strong man’ (Luke 1:69)
- c. *i uka tara viri ge tuha-ka ge*
 3SG NEG one person 3SG.IRR bone-ADJ 3SG.IRR
kolotata tabu ia.
 tie again 3SG.F
 ‘There was no person **strong** enough to tie him up.’ (Mark 5:3)
- d. *e huriki lobo ri gi gale tuha-ka a Vure.*
 ART.PAUC PL finish 3PL IRR call bone-ADJ ART God
 ‘Everyone shall call out **strongly** (= cry out, shout) to God.’ (Jonah 3:8)

54. Nakanai (iso 639-3: nak, Meso-Melanesian)

In Nakanai, Chowning & Goodenough (2016) give the root *tuha* as having the meanings (i) left humerus of a dead person or a substitute for it, used in mortuary ceremonies; (ii) spear decorated with a human humerus. When marked with *la-*, a “noun formative suffix” which is prefixed to the majority of nouns in Nakanai, *tuha* denotes ‘bone’. The root *tuha* appears in numerous morphologically derived forms and compound forms with meanings associated with strength.

Tuha is used with the adjectiviser *-ka* (cognate with Bola *-ka*, see section 53) and the stative verb derivative *ma-* with meanings associated with strength, (54a) and (54b).

(54) *tuha* ‘bone’

- a. *tuha-ka ~ tuha-ka-la*
 bone-ADJ bone-ADJ-?
 ‘very hard-working, strong (of person)’

- b. *ma-tuha*
 STAT-bone
 (1) ‘full-grown, fully developed (as fruit)’, (2) ‘mature’

In addition, *tuha* also combines with several verbs to form idiomatic expressions with meanings consistent with the association BONES ARE STRENGTH:

- c. *tuha-magiri*
 bone-stand
 ‘strength (of a person)’
- d. *tuha-tavu*
 bone-grasp
 ‘devoted to a task; to continue working at it’
- e. *tuha-toro*
 bone-strong
 ‘to take refreshment, eat breakfast’

We also find expressions with *tuha* that are consistent with the association LACK OF BONES IS A LACK OF STRENGTH:

- f. *tuha-tili*
 bone-hang
 ‘exhausted, as from working hard or hunger’
- g. *tuha-malulu*
 bone-paralyzing.disease
 ‘lazy, indolent’
- h. *tuha- maveve-ra*
 bone-defeated-?
 ‘lazy’

55. Tolo (iso 639-3: tlr, Southeast Solomonic)

In Tolo (Crowley 1986), *suli-* ‘bone’ is the root on which *su~suli-ha* REDUP~bone-ADJ ‘strong’ and *su~suli-ha-na* REDUP~bone-ADJ-NMLZ ‘strength, power’ are formed.¹³ The use of *susuliha* as a predicate meaning strong is illustrated in (55a-b). *Susuliha* is also found modifying the verb *lepo* ‘talk, speak’ in the idiomatic expression *lepo susuliha* ‘to demand, scold, reprimand’, illustrated in (55c).

- (55) *suli-* ‘bone’
- | | | | | | | |
|----|----------------------|------------|----------|-------------|-----------|-------------------|
| a. | <i>soa</i> | <i>nia</i> | <i>e</i> | <i>sola</i> | <i>ba</i> | <i>su~suli-ha</i> |
| | 3SG.M | ART | PRED | very | go | REDUP~bone-ADJ |
| | ‘He is very strong.’ | | | | | |

¹³ The Tolo dictionary does not provide an discussion of morphemes, but it is clear from a survey of forms in the dictionary that *-ha* is a suffix used to create property words, both with (e.g., *karuna* ‘thorn’ > *karu-karu-ha* ‘thorny’, *ame* ‘weaking’ > *ame-ame-ha* ‘weak by nature’, *katsua* ‘to carve, to sharpen’ > *katsu-katsu-ha* ‘to have a sharp point’) and without reduplication of the root (e.g., *habu-na* ‘blood-POSS’ > *habu-ha* ‘bleed’).

- b. *nau matahu a olo i kolo rongona e sola*
 1SG afraid ART wade ART water because PRED very
su~suli-ha
 REDUP~bone-ADJ
 ‘I’m afraid to wade in the river because it’s running strongly.’
- c. *Oliva e lepo su~suli-ha vania baka bule~bule-ha*
 Oliva ART talk REDUP~bone-ADJ to.him child REDUP~crazy-ADJ
 ‘Oliva scolded the naughty child.’

56. Ontong Java (iso 639-3: ojv, Polynesian, Solomon Islands)

In Ontong Java (Salmon 1974), *ivi* is used to denote ‘bone’ as in (56a). The same form appears with the meaning ‘strong’ adnominally in (56b) and with the meaning ‘powerful’ predicatively in (56c).

(56) *ivi* ‘bone’

- a. *maa ke poi i ηamuηamu ke ivi*
 for ART dog PURP chew ART bone
 ‘It’s for the dog to chew the bone.’
- b. *kaupiala ivi u haa-pi’o ke i’ai*
 boy bone IMMED CAUS-bend ART knife
 ‘The strong boy bent the knife.’
- c. *ηaa vuhu-ηa ηau e ivi*
 DEM hit-NMLZ 1SG too bone
 ‘My blows are too powerful.’

57. Mwotlap (iso 639-3: mlv, North and Central Vanuatu)

The Mwotlap noun *hyē* is glossed as ‘bone’ and ‘strength’ by François (2018). Both these meanings are apparent in (57a). Examples (57b-c) further illustrate the use of *hyē* to reference to human strength.

(57) *hyē* ‘bone’

- a. *nē-hyē-n tateh*
 ART-bone-3SG NEG.EXIST
 (1) ‘It has no bones.’ (e.g. describing a mollusc)
 (2) ‘He/she has no strength.’ (e.g. describing a person)
- b. *nē-hyē-n na-maymay*
 ART-bone-3SG 3SG-hard
 ‘He’s strong [his strength is hard]’ (lit. his/her bones are hard)
- c. *nē-hyē-n ne-mdawdaw*
 ART-bone-3SG 3SG-soft
 ‘He’s weak [his strength is soft]’ (lit. his/her bones are soft)

58. Mota (iso 639-3: mtt, North and Central Vanuatu)

Codrington & Palmer (1896) give Mota *suri* as denoting ‘bone’ (as in 58a) with the extension to ‘strength’. They illustrate this latter meaning with the example in (58b).

- (58) *suri-* ‘bone’
- a. *qal~qalo-suri-u*
 REDUP~knot-bone-?
 ‘joints’
- b. *ineia mun na-suri-na*
 3SG with ART-bone-3SG
 ‘He’s strong’ (lit. he is with his bones)

59. Lewo (iso 639-3: lww, North and Central Vanuatu)

In Lewo (Robert Early pers. comm., Early 1994), *puryu* denotes ‘bone’ as in (59a). When used with *kawa* ‘strong’, *puryu* has meanings associated with strength. In (59b) *puryu* is used as the subject predicated to *kawa* ‘be strong’. In (59c) the nominalisation *puryu-kawa-ena* bone-strong-NMLZ refers to ‘power, strength’.

- (59) *puryu* ‘bone’
- a. *sinom puryu na ika*
 swallow bone GEN fish
 ‘swallow a fish bone’
- b. *puryu-na kana*
 bone-3SG strong
 ‘He/she is strong.’ (lit. his/her bone is strong)
- c. *potena e-a na-manmarua-ena na-sitom-ena*
 thanks LOC-3SG ART-wise-NMLZ ART-love-NMLZ
na-puryu-kana-ena so-mã...
 ART-bone-strong-NMLZ POSS-2SG
 ‘Thank you for your wisdom, love (and) power, ...’

60. Luang (iso 639-3: lex, South-east Maluku)

Luang *ruri* is a noun used to mean ‘bone’ with a possessive suffix (60a) and to mean ‘thorn’ without a possessive suffix (60b). The final /i/ is dropped on suffixation.

- (60) *ruri*
- a. *mhi'-doini rur-ni dela*
 2PL-take.out bone-3SG DEM
 ‘Take out those bones.’
- b. *r-le'ewu au ruri pa r-hi'a lai-ni*
 3PL-make.circle tree bone PURP 3PL-make crown-3SG
 ‘They made a circle of thorns to make a crown.’

Ruri can also be used as an abstract noun to denote ‘strength, power’, either with a possessive suffix (60) or without (60).

- c. *hruilarna n-ten rur-ni la eda de*
 sailfish 3SG-try bone-3SG LOC COP DEM
 ‘The sailfish exerted his **strength** on the one that was there.’

- d. *en-papan-targa* **ruri** *lai* *maka* *ota* *nal* *itla*
 3SG-come.with-DUR:OBJ bone to REL FUT 3SG:talk 1PL.INCL
mori *lewna*
 live save
 ‘He comes with **power** that will save us.’

When used with subject agreement prefixes, *ruri* is predicate translated with ‘strong’, as in (60) and (60):

- e. *manke'a* *de* *na-ruri*
 man DEM 3SG-bone
 ‘That man is **strong**.’
- f. *a* *orat-ni* *mana* *na-ple'era* *me* *tor-ni* *mana*
 3SG muscle-3SG even 3SG-straight and knee-3SG even
na-ruri
 3SG-bone
 ‘His ligaments and knees became straight and **strong**.’

In addition, Luang has an idiomatic coordinative compound, *ruri orta*, literally ‘bone muscle’, is used for ‘very strong’, as in (60g).

- g. *manke'a* *he'a* *maka* *ka-ruri* *ka-'orta?*
 man who REL REL-bone REL-muscle
 ‘Which man was very strong?’

61. Leti (iso 639-3: lti, South-east Maluku)

Leti *ruri* (Engelenhoven 2004, Aone van Engelenhoven pers. comm.) is a noun used to mean ‘bone’, as in (61a).

- (61) *ruri* ‘bone’
 a. *sivruri*
 sivi-ruri
 chicken-bone
 ‘chicken **bone**’

Ruri is also used to denote ‘strong’ as a stative property verb with a verbal agreement suffix (61b), as a dynamic verb with a verbal agreement prefix (61c), and as a nominal attribute when reduplicated (61d).

- b. *lorurni*
 loi=ruri-ni
 canoe=bone-3SG
 ‘The canoe is **strong**!’
- c. *loi nruri*
 loi *n-ruri*
 canoe 3SG-bone
 ‘The canoe gets **strong**!’

- d. *upasrurururdiavra lalavandavardi*
 upasrui ru~**ruri**=davra la~lavna=davra=di
 sailfish REDUP~bone=AUG REDUP~big=AUG=DEM
 ‘the very **strong** and big sailfish now’

62. Kisar (iso 639-3: kje, South-east Maluku)

As in its two near relatives discussed in the preceding section, Kisar *ruri* is a noun denoting ‘bone’ (62a) and ‘thorn’ (62b). Examples are taken from Christensen (nd.).

(62) *ruri* ‘bone’

- a. *ruri kelen*
 bone neck
 ‘spine’ (lit. bone neck)
- b. *sapu onno nin ruri nam-mori*
 orange place 3SG.POSS bone 3SG-live
 ‘There are a lot of thorns in the orange trees.’

When used with subject agreement prefixes, *ruri* is predicative and translated with ‘strong’, as in (62c).

- c. *Pul na-ruri=yedi me'e, maa Naomi ka na-ruri makun*
 Paul 3SG-bone=already COMPL but Naomi NEG 3SG-bone still
 ‘Paul is strong already, but Naomi is not yet strong.’

In four idiomatic collocations, Kisar *ruri* ‘bone’ is associated with strength and exertion. In (62d) and (62e), *ruri* is used in nominal compounds introduced by the verb *-odi* ‘take’ to indicate that strength was used to carry out an act. In (62f) the idiom *ho'ok ruri* ‘measure bone’ is a phrase denoting ‘use all one’s abilities to cause s.t. to happen, work with all your might’. *Ruri* is found in another idiom *-ro'oh-ruri* is a nominal compound referring to capability to work in (62g).

- d. *ik k-odi ruri-pe'el howok kirna leke lernala*
 1PL.INCL 1PL.INCL-take bone-diligence work garden so.that obtain
hanana'an
 food
 ‘With **strength** and diligence, we work the garden in order to obtain food.’
- e. *an wakunu n-odi ruri-lai mamani*
 3SG talk 3SG-take bone-? always
 ‘He spoke **forcefully** all the time.’
- f. *honowok onne i ho'ok rur-na mele na-mwali*
 work DEM 1SG measure bone-3SG arrive 3SG-become
 ‘I used all my **abilities** to do that work.’
- g. *ik howok kirna perlu-mouedi warna-warna na-ro'oh-rur-na*
 1PL.INCL work garden need different.sorts 3SG-?-bone-3SG
 ‘When we work in the garden, we need different sorts of **capabilities**.’

63. Sawu (iso 639-3: hvn, Sumba-Sawu)

In Sawu (Grimes 2008), *ru* can be used to denote ‘bone’ (63a) and ‘strong’ (63b).

(63) *ru* ‘bone’

- a. *ru* *kètu*
bone head
‘skull’
- b. *ne* *dèpi* *merèi* *no* *do* *tao* *ngati* *b'ara*
DEM mat carry.mat 3SG.POSS REL make from material
do *ru*
REL bone
‘His mat was made from strong material.’

In addition, Sawu has an idiomatic coordinative compound, *ru-kele*, literally ‘bone tendon’, which is given in the Sawu dictionary as meaning ‘hard, make every effort, do everything in power’.

64. Kambara (iso 639-3: xbr, Sumba-Sawu)

In Kambara (Onvlee et al. 1984), *ri* can be used to denote ‘bone’ (64a), ‘thorn’ (64b), and ‘leaf nerve’ (64c).

(64) *ri* ‘bone’

- a. *ri* *kajia*
bone back
‘spine, back bone’
- b. *ri* *ma-dàka*
bone ADJ-sharp
‘sharp thorn’
- c. *ri* *menggitu*
bone lontar.palm
‘nerve of a lontar palm leaf’

Derived from *ri* by means of the prefix *pa-*, Kambara *pa-ri* is used as an attribute denoting strong in relation to animates, as in (64d).

- d. *tau* *pa-ri*
person CTR-bone
‘a strong man’

Pa-ri was also found in the Kambara dictionary in what appears to be idioms relating to strength:

- e. *pa-ri* *kalukingu*
CTR-bone jungle.fowl
‘very strong’ (lit., strong as a jungle fowl’)
- f. *ka* *ma-pa-ri,* *ka* *ma-pa-kalotu*
CONJ 1PL.EXCL-CTR-bone CONJ 1PL.EXCL-CTR-muscle
‘so that we know ourselves to be strong’ (lit., that we have bones and muscles)

65. Wolio (iso 639-3: wlo, Celebic)

In Wolio (Anceaux 1987) *buku* means ‘bone’, as in (65a). When referring to parts of plants, *buku* has metaphor-driven associations such as those in (65b-c).

- (65) ***buku*** ‘bone’
- a. ***buku-na salangga***
bone-3SG shoulder
‘collar-bone, clavicle’
 - b. ***buku-na tawa***
bone-3SG leaf
‘vein, nerve of leaf’
 - c. ***buku-na towu***
bone-3SG sugarcane
‘joint of sugarcane’

The association of *buku* with strength is found in the idiom with *-oge* ‘big’, as in (65d).

- d. ***ma-oge buku-na***
STAT-big bone-3SG
‘big and fat, strongly built’

Anceaux (1987) also gives the glosses ‘effort’ and ‘exertion’ for *buku*. This sense of *buku* is found in a verbal derivation of *buku* by means of the intransitiver verbalizer *ko-* (65e) and in an idiomatic expression with *saori* ‘bad’ (65f).

- e. ***ko-buku***
INTR-bone
‘exert oneself’
- f. ***saori buku***
bad bone
‘be overworked, fag oneself out’

66. Pamona (iso 639-3: pmf, Celebic)

Adriani (1931) defines Pamona (aka Bare’e) *wuku* as meaning ‘bone, pip, thickness, stature, knob’. He further observes that *wuku* is ‘the seat of bodily strength (original: *de zetel der lichaamskracht*)’. This sense of *wuku* can be observed in the two expressions given in (66a) and (66b).

- (66) ***wuku*** ‘bone’
- a. ***ma-lente wuku***
ADJ-listless bone
‘having no strength, no courage’
 - b. ***ma-roso wuku***
ADJ-powerful bone
‘be strong’

67. **Tukang Besi (iso 639-3: tuk, Celebic)**

In *Tukang Besi* (Donohue 1999), *buku* denotes ‘bone’, as in (67a). *Buku* also appears as an adjective derived with the adjectiviser *me-* with the meaning ‘strong’ (67b).

(67) *buku* ‘bone’

- a. *no-ban-siku-aku* *na* *buku* *karakara-su*
3.REAL-break-elbow-3SG.OBJ NOM bone rib-NSG.POSS
‘He broke my ribs with his elbow.’
- b. *te* *owaha melangka* *me-dumpu* *atu* *no-me-buku*
CORE horizontal.support ADJ-short DEM 3.REAL-ADJ-bone
‘That short horizontal support is **strong**.’

68. **Muna (iso 639-3: mnb, Celebic)**

In *Muna* (van den Berg and Marafad 2016), *buku* denotes ‘bone’ (68a), ‘cuttlebone’ (68b), and ‘stalk’ (68c).

(68) *buku* ‘bone’

- a. *no-rii* *buku-no*
3SG.REAL-painful bone-3SG.POSS
‘His bones felt painful.’
- b. *buku-no* *bhankuta*
bone-3SG.POSS cuttlefish
‘cuttlebone, internal shell’
- c. *ne-totowi* *buku-no* *kahitela*
3SG.REAL-cut.off bone-3SG.POSS maize
‘She was cutting off the stalks of the maize cobs.’

Buku is also used to denote as the seat of strength in the body. It can be found with this sense in examples such as (68d).

- d. *kakolehano* *buku, o-sundu-e* *ne* *pata koalahano* *itu*
what.a.waste bone 2SG-overwork-3SG LOC useless.thing DEM
‘What a waste of your **strength**, you used it for something futile.’

This sense of *buku* is also used in regular combination with verbs ‘weak’ and ‘strong’, as in (68e) and (68f).

- e. *no-maluso* *buku-no* *rampano* *no-karadhaa*
3SG.REAL-weak bone-3SG.POSS because 3SG.REAL-work
surue alo miina bhe kalodo
all night NEG with sleep
‘He felt exhausted (his bones are weak), because he had worked all night without sleeping.’

- f. *ane naando do-rangku-hi naando no-ghosa-hi*
 when exist 3PL.REAL-young-PL exist 3SG.REAL-strong-PL
dua buku
 also bone
 ‘When one is young, one is still strong (bones are strong).’

Several idioms referring to work and one’s ability to carry it out involve *buku*: (i) *buku-i* is a transitive verb meaning ‘finish off heavy work’ (68g); (ii) *pooli buku*, literally ‘be able bone’, is used to mean ‘still able to work’, (68h); (iii) *kaowulehano buku*, literally ‘tiredness of bones’ is used to mean ‘fruit of one’s labour’, (68i).

- g. *no-wora gholeo no-rondo-mo*
 3SG.REAL-see sun 3SG.REAL-be.night-PFV
no-piki-buku-i-e-mo karuku-no
 3SG.REAL-quickly-bone-ITR-3SG.OBJ-PFV grass-3SG.POSS
 ‘When she saw that it was getting dark, she finished the work clearing her field quickly.’

- h. *ko tulumu kanau, kinanti a-pooli buku*
 don’t help 2SG.OBJ while 1SG-be.able bone
 ‘Do not help me while I am still able to work myself.’

- i. *no-perapi-e-mo kao-wule-ha-no buku-no*
 3SG.REAL-harvest-3SG-PFV NMLZ-tired-NMLZ-3SG.POSS bone-3SG.POSS
indefie ini
 sometime ago
 ‘He can now enjoy the fruits of his past labour (lit., the past tiredness of his bones).’

69. Tolaki (iso 639-3: lbw, Celebic)

In Tolaki (Owen Edwards pers. comm.), *βuku* ‘bone’ (69a) is used in combination with *molulu* ‘weak’ to denote someone who is physically exhausted (69b) or weak (69c).

(69) *βuku* ‘bone’

- a. *βuku ase*
 bone chin
 ‘jaw bone’
- b. *molulu βuku=nggu*
 weak bone=1SG.GEN
 ‘I feel weak/tired (i.e. after exerting oneself physically)’
- c. *keno toono molulu βuku hende ingo?o...*
 if person weak bone like 2SG
 ‘Well, maybe for a weak person like you...’

70. Mori Bawah (iso 639-3: xmz, Eastern Celebic)

Esser & Mead (2011) gloss Mori Bawah *wuku* with ‘bone’, ‘pip’, ‘seed’, ‘knob’, ‘shell’ in different referential contexts. They also note that *wuku* is the ‘seat of power’ (Esser & Mead 2011: 104). This sense of *wuku* can be observed in the expression given in (70).

- (70) *wuku* ‘bone’
tompa-a-no *wuku-no*
 limit-NMLZ-3SG bone-3SG
 ‘according to the extent of his power, with all his might’

71. Balantak (iso 639-3: blz, Celebic)

The Balantak (Busenitz and Bradbury 2016) noun *wuku* denotes ‘bone’, as seen in (71a). When derived with the denominal verbaliser *mi-*, *wuku* is also used in combination with verbs of working to denote ‘work hard’, as seen in (71b) and (71c).

- (71) *wuku* ‘bone’
- a. *antok-na wuku*
 meat-3SG bone
 ‘meat left on the bone’
- b. *raayaʔa mi-wuku balimang na sawah*
 3PL INTR-bone work LOC rice.paddy
 ‘They worked very hard out in the rice paddy.’
- c. *waka-na mo’ugot mi-wuku parenta*
 body-3SG be.sweaty INTR-bone work
 ‘His body was sweaty from working hard.’

72. Banggai (iso 639-3: bgz, Celebic)

In Banggai (Bergh 1953), *buku* is a noun meaning ‘bone’ as in (72a).

- (72) *buku* ‘bone’
- a. *lapamo bande doo inoli, ko buku-no domo k<in>abai*
 finished monkey DEM cookedART bone-3SG REL <PASS>make
tiilon...
 lime
 ‘Once the monkey had been burnt, his bones that had been made into lime....’

Derived forms of *buku* are found with meanings relating to strength and exertion: marked with active voice, *buku-an* ‘make strong’ (72b); marked with the adjectivizer suffix, *buku-an* is used adverbially to denote that an action is done with great vigour and frequency (72c); marked with the intransitive verbalizer prefix, *ba-buku* is a predication meaning ‘exert oneself’ (72d).

- b. *ko-buku-ane*
 2SG.ACT-bone-3SG
 ‘Make it strong!’
- c. *mau nggu-ba-buku, bai aki na-ingkat*
 even 1SG-INTR-bone but NEG 3SG-lift
 ‘Even if I exert myself, it can’t be lifted.’
- d. *buku-an ba-susup*
 bone-ADV INTR-suck
 ‘smoke a lot’

An idiom ‘finish bone’ is also used with the related sense of ‘put in a great effort’ (72e).

- e. *na-kabus-ene buku*
 3SG-finished-3SG bone
 ‘he tries really hard, he goes to a lot of trouble’

73. Makasar (iso 639-3: mak, South Sulawesi)

Cense (1979) gives Makasar *buku* with the following meanings ‘bone, fish bone, mango stone, knot’, as well as ‘working strength, someone who can work quickly, someone who can get a job done’. The association between bone and work and the ability work can be seen in many examples in the dictionary, such as the following:

(73) *buku* ‘bone’

- a. *kere=mi tau=a buku=nna?*
 where=TAM.3 person=3 bone=3.POSS
 ‘Where is this person’s reward for his work (i.e., pay)?’ (lit. where is this person’s bones?)

- b. *anne inakke, ana', dodomma', tena=mo apa na=kulle*
 this 1 child weak NEG=PFV what 3=can
buku=ηku, ikau mam=i=ntu buku=ηku
 bone=1.POSS 2 only=3=that bone=1.POSS
 ‘Child, I am weak, my bones are no longer capable of anything, you alone can do my work’

- c. *ηyapa=i nu=tea am-pa-ri=balla=ki i Baso'*
 what=3 2=not.want ACT-CAUS-PREP=house=2 NAME
na=buku=ntu?
 3=bone=that
 ‘Why don’t you want Baso in the house, when he can do work?’

A verb derived from *buku* by means of the active voice prefix is used to mean ‘to do/work with energy (original: *met fut iets doen*). There are also several idioms using *buku* marked with the active voice prefix, such as *a'-buku-bassi* AF-bone-iron, used of someone who is able to carry out heavy work.

74. Bugis (iso 639-3: bug, South Sulawesi)

In Bugis (Matthes 1874), *buku* is a noun meaning ‘bone’ as in (74a).

(74) *buku* ‘bone’

- a. *buku bale*
 bone fish
 ‘fish bone’

Buku is also defined as meaning ‘strength’ in Matthes (1874). Examples illustrating this sense are (74b) and (74c).

- b. *nyawa ma'-tepu-pa silaong buku ma-watang*
 spirit/breath INTR-whole/full-IPF and bone ADJ-powerful
 ‘when one is completely strong and healthy’

- c. *buku-i=wi, mennang, gangka ulle-mu ma-watang*
 bone-APPL=3.ABS all until.limit ability-2.GEN ADJ-powerful
 ‘Use all your strength, people!’

75. Tontemboan (iso 639-3: tnt, Minahasan)

In Tontemboan *ruʔi* has the meaning ‘bone’ as illustrated in (75a). By means of the prefix *ma-*, *ruʔi* derives an adjective translated as ‘hard’ (75b). Combined with the adjective *kəte* ‘hard’, *ruʔi* forms an expression referring strength or fully grownness in (75c).

(75) *ruʔi* ‘bone’

- a. *wangkər ruʔi si sapi anioʔ*
 big bone DEF cow DEM
 ‘meat left on the bone’
- b. *ma-ruʔi si asing anioʔ*
 ADJ-bone DEF salt DEM
 ‘The salt has gotten hard’
- c. *kəte ruʔi*
 hard bone
 ‘strong of muscles, adult’

Abbreviations

1	first person	INTR	intransitive
2	second person	IPF	imperfect
3	third person	IRR	irrealis
ABS	absolute	ITR	iterative
ACT	active	LIG	ligature
ADJ	adjective	LOC	locative
ADV	adverbial	M	masculine
APPL	applicative	N	neuter
APR	accessory present	NEG	negative
ART	article	NFINAL	non-final
AUG	augment	NFUT	near-future
AUX	auxiliary	NMLZ	nominalizer
BAS	basic cross-referencing	NPST	non-past
BEN	benefactive	NSG	non-singular
CAUS	causative	OBJ	object
CONJ	conjunction	PASS	passive

COP	copular	PRF	perfect
CORE	non-nominative core marker	PFV	perfective
CTR	controller	PL	plural
DECL	declarative	POSS	possessive
DEF	definite	PRED	predicate
DEM	demonstrative	PREP	preposition
DER	derivational	PROG	progressive
DIST	distal	PRS	present tense
DS	different subject	PST	past tense
DU	dual	PURP	purposive
DUR	durative	QUANT	quantifier
ERG	ergative	R	referent
EMPH	emphatic	REAL	realis
EXCL	exclusive	REDUP	reduplication
F	feminine	REL	relative clause
FOC	focus	REM	remote
FPST	far past	SEQ	sequential
FUT	future	SIM	similative
GEN	genitive	SIMUL	simultaneous
GL	goal	SG	singular
HAB	habitual	SS	switch subject
HIST	historical tense marker	STAT	stative
IMMED	immediate	TAM	tense, aspect, mood marking
IMP	imperative	TEL	telic
INCL	inclusive	TOP	topic
INT	intensive	VT	versatile tense

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