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Ethnozoology: cultural and ethnopharmacological uses of amphibian and reptiles among the people of Dhirkot, Pakistan

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SUMMARY

Human not only uses the herptiles species, but also produces negative impact on the diversity and density. These kept in mind and developed the research; main objectives of the study are; to know the human impact and interaction on the diversity and distribution of herptiles species. Questionnaires and semi-structured interviews were applied to collect data from informants of Dhirkot. During the study noted that these species were used for different purposes i.e. medicinal, trade, narrative and superstitious. It is noted that the body parts of 18 herptile species are used in different recipes i.e. fat is the most utilized body part (14 recipes), followed by oil (3) and skin (1). The inhabitant use fat to treat snake bite, weakness, backbone pain, joint pain and eyes diseases.

Keywords: Ethnoamphibian, Ethnoreptiles, Superstitious, Herptiles, Pakistan

Citation: Altaf, M., S. Adil. 2023. Ethnozoology: cultural and ethnopharmacological uses of amphibian and reptiles among the people of Dhirkot, Pakistan. International Journal of Forest Sciences. 3:01-11.

Received: January, 2023; **Accepted:** February, 2023

INTRODUCTION

More than 10,450 species of reptiles are identified in the worldwide, (Uetz, 2016); while total 7,850 amphibian species are noted (AmphibiaWeb, 2018). Total 195 species of reptiles are documented in Pakistan (Khan, 2006). Twenty four (24) amphibian species are present in Pakistan by Khan (2010). Pakistan is a major geographical location. Pakistan covers an area of 796,095 km² and is divided into three primary zoogeographical regions: the first Palearctic, the second Oriental, and the third Ethiopian. Its southwestern border is connected to the sea of Arabian, while its north end is located in the permanent snow scene in the vast Himalayan region (Khan, 2006; Rafiq, 2019). Mountains and plateaus in the west, north, and northwest represent the merger of three major mountain areas i.e. i) Himalayas, ii) Karakorum and iii) Hindukush. Its mountainous topography has had a significant impact on the climate, geology, hydrology, and physiography of Pakistan, as well as the distribution and composition of its fauna and flora (Khan, 2006).

Several wandering snake attracter tribes are actively involved in the destruction and extinction of reptile species. They make deals with wild animals, reptiles, and other creatures. Known as "sanyasies," "gagras," and "Tapri-was," they have posed a threat to Pakistan's native reptile population. (Khan, 2006). Harshly and continuously hunt various reptile species. Furthermore, the remains of these reptiles

are in high demand in common marketplaces, as national physicians use them in the development of recipes for the treatment of a variety of general maladies. (Khan, 2006; Altaf, 2016; Altaf *et al.*, 2018; Altaf *et al.*, 2020; Faiz *et al.*, 2022b). The aim and purpose of the research are to know the cultural and medicinal uses of amphibian and reptiles in the Dhirkot, Pakistan.

MATERIALS AND METHODS

AREA OF STUDY

The research region is located in a damp environment with monsoon access. The changes in altitude cause a slew of differences in rainfall and humidity in various sections of the region. Summer (mean temperature 37°C) is mild, whereas winter (average temp 4°C) is bitterly cold, with snowfall at higher elevations. Snowfall was also observed in lower locations such as Mandri, Salian, Dhar, and Munhasa on occasion. The average rainfall was measured to be 150mm. The vegetation includes *Pinus wallichiana*, *Cedrus deodara*, and *Pinus roxburghii*, as well as subtropical pine forests and Himalayan mixed temperate forests (Bibi *et al.*, 2013).

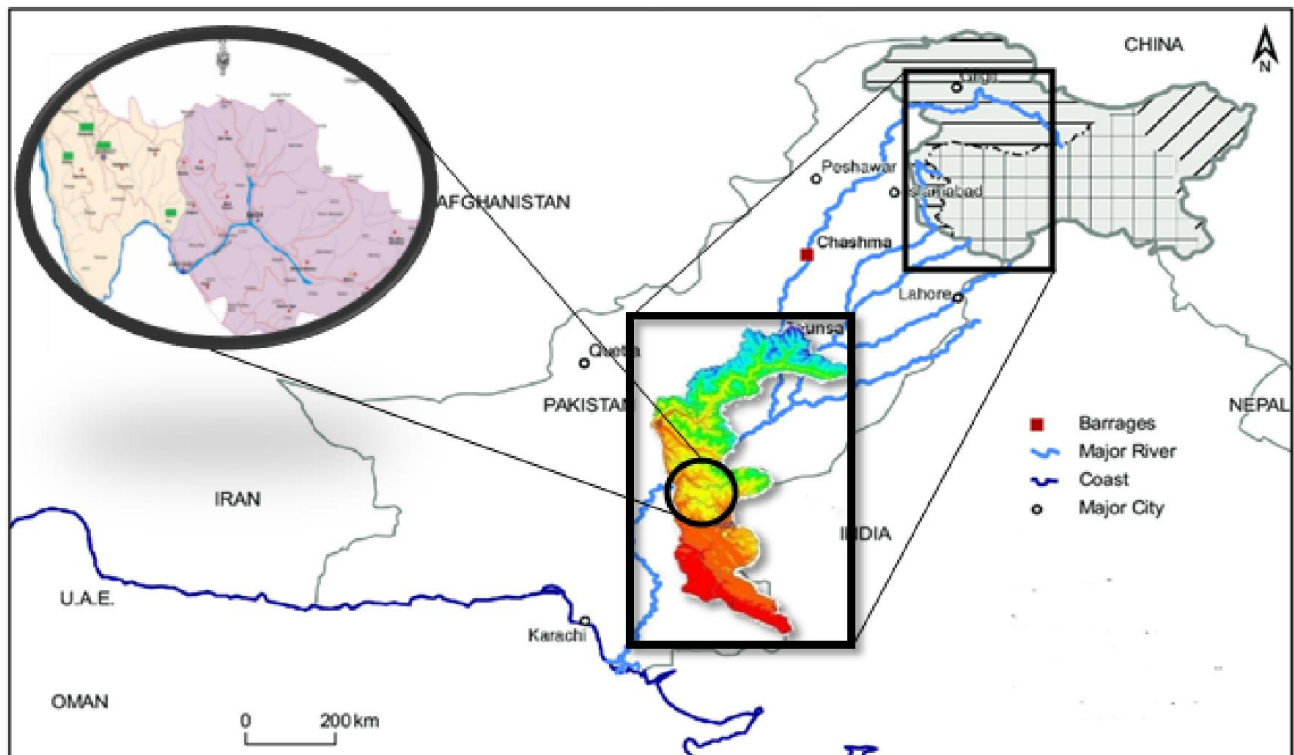


Figure 1: Map of the Dhirkot, district Bagh.

ASSESSMENT OF HUMAN-HERPETOFAUNA INTERACTION

Throughout the investigation, it was discovered that humans exploited these animals for a variety of purposes.

Frequency of citation

The frequency of informers who reported medicinal applications of each species is shown by FC.

STATISTICAL ANALYSIS

Use-value

The “UV” of herptiles taxa is computed applying the following equation:

$$UV = \sum U/n$$

Whereas UV is a species' usage value,

The “n” is the frequency of informers per life forms, and “U” is the frequency of eyewitnesses (Trotter and Logan, 1986; Phillips and Gentry, 1993).

Similarity index

SI is calculated using formula (Altaf *et al.*, 2018):

$$SI = M_s/M_t \quad (0 \leq SI \leq 1)$$

Where,

Ms = Similar amount of therapeutic uses in current and earlier published materials of a taxa, and Mt = Overall frequency of therapeutic uses in the current study.

RESULTS AND DISCUSSION

Respondents of the study area consist of male (36%) and female (64%); education of the respondents as; MA (7%), MSc (8%), BS (3%), FSc (4%), I. Com (3%), FA (6%), Matric (28%), Primary (12%), BA (3%), Middle (10%), and Illiterate (16%). Data collected from the peoples having different occupation i.e. Government employee (9%), Non-Government employee (26%), labor (1%), student (24%) and housewife (40%) from the study area. Data collected from the different villages from the study area is as; Mandri (60%), Sahalian (32) and Dhirkot (8). Respondents casts from the study area is as; Abbasi (86), Awan (9); Raja (4), Mughal (1). All the respondents are Muslims.

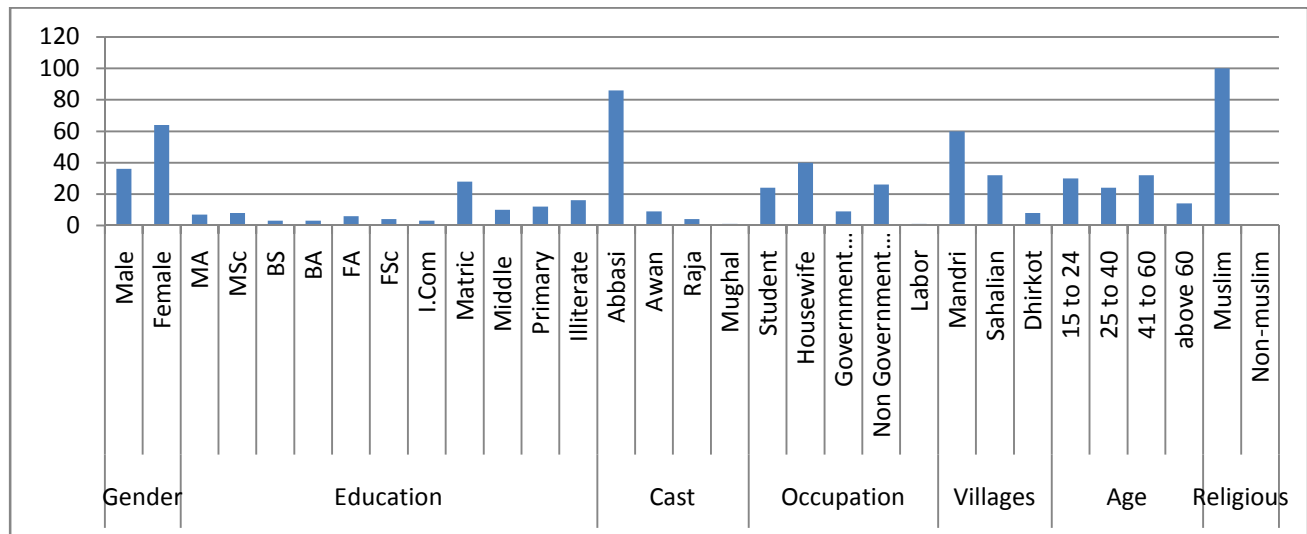


Figure 2: Profile of the respondents of the study area.

During the study noted that eight species of herpetofauna have narrative stories i.e. snakes (e.g. striped keelback, common krait, russell's chain viper, Himalayan pit viper, rope-snake, red spotted diadem snake, chekered keelback and

brown cobra) heads have stone; these stones have ability to absorb poison of each snake; while toad (e.g. Himalayan toad has a pot of poison, but God has forbid this species to use poison) (Table 1).

Out of total, 16 species of herpetofauna are used for different traditional medicines i.e. common krait, Oriental garden lizard, Russell's chain viper, leopard gecko, Himalayan pit viper, Brooke's house gecko, yellow belly/common house gecko, agror agama/Monitor lizard, badkhashan rock agama, Himalayan agama, North-Pakistan agama, blue rock agama, Himalayan skink, brilliant ground agama, brilliant ground agama, Bengal monitor, common tuberculated ground gecko and brown cobra) to treat different diseases viz. snake bite, backbone pain, joint pain, weakness, cancer and eyes diseases (Table 1).

During the research noted that 10 species (viz. badkhashan rock agama, Himalayan agama, North-Pakistan agama, Himalayan skink, blue rock agama, leopard gecko, yellow belly/common house gecko, brooke's house gecko, reticulated plump-bodied gecko and common tuberculated ground gecko) have superstitious e.g. if someone kill these species, it is good for this person. During the study noted that only one species is captured for trade i.e. leopard gecko (Table 1).

Common krait, Oriental Garden Lizard, Russell's chain viper, yellow belly/common house gecko, agror agama / monitor lizard, north-Pakistan agama, Bengal monitor, brown cobra is used to treat various diseases in past publications i.e. anti-venom, visual, joint pain, eye sight, urination, stool, flatus, anti-venom, pain, vitiligo, malaria, cancer, healing, wounds, malaria, jaundice, piles, arthritis, erectile dysfunction, muscular pain, fungal infection, virility, visual illnesses (Padmanabhan and Sujana, 2008; Benarjee *et al.*, 2010; Dixit *et al.*, 2010; Chakravorty *et al.*, 2011; Chinlapianga *et al.*, 2013; Lalmuanpuui *et al.*, 2013; Arshad *et al.*, 2014; Bagde and Jain, 2015; Aloufi and Eid, 2016; Ajagun *et al.*, 2017; Borah and Prasad, 2017; Yeshi *et al.*, 2017; Altaf *et al.*, 2018; Adil *et al.*, 2019; Altaf and Faiz, 2021; Ijaz and Faiz, 2021; Nazir, 2021; Saleem *et al.*, 2021; Zainab, 2021; Ammatussalm, 2022; Faiz *et al.*, 2022a; Habib, 2022; Umair *et al.*, 2022).

Table 1: Cultural uses of herptile in Dhirkot.

Names	Narrative	Medicinal	Superstitious	Trade
<i>Amphiesma stolatum</i> Striped Keelback	√	X	X	X
<i>Bufo himalayanus</i> Himalayan toad	√	X	X	X
<i>Bungarus caeruleus caeruleus</i> Common krait	√	√	X	X
<i>Calotes versicolor</i> Oriental Garden Lizard	X	√	X	X
<i>Cyrtopodion scabrum</i> Common tuberculated ground gecko	X	√	√	X
<i>Daboia russelii russelii</i> Russell's chain viper	√	√	X	X
<i>Eryx johni</i>	√	X	X	X

Common Sand boa				
<i>Eublepharis macularius</i>	X	√	√	√
Leopard gecko				
<i>Gloydus himalayanus</i>	√	√	X	X
Himalayan pit viper				
<i>Hemidactylus Brookii</i>	X	√	√	X
Brooke's house gecko				
<i>Hemidactylus flaviviridis</i>	X	√	√	X
Yellow belly/common house gecko				
<i>Laudakia agrorensis</i>	X	√	X	X
Agror agama / Monitor lizard				
<i>Laudakia badakhshana</i>	X	√	√	X
Badkhashan rock agama				
<i>Laudakia himayalayana</i>	X	√	√	X
Himalayan agama				
<i>Laudakia pakistanica auffenbergi</i>	X	√	√	X
North-Pakistan Agama				
<i>Laudakia tuberculata</i>	X	√	√	X
Blue rock agama				
<i>Naja Oxiana</i>	√	√	X	X
Brown cobra				
<i>Ptyas mucosus mucosus</i>	√	X	X	X
Rope-snake				
<i>Scincella himalayana</i>	X	X	√	X
Himalayan skink				
<i>Spalerosophis diadema diadema</i>	√	X	X	X
Red spotted diadem snake				
<i>Swaligekko battalensis</i>	X	X	√	X
Reticulated plump-bodied Gecko				
<i>Varanus bengalensis</i>	X	√	X	X
Bengal monitor				
<i>Xenochrophis piscator piscator</i>	√	X	X	X
Chekered Keelback				

Body part(s) used

The body parts of 18 **herptile** species are used in different recipes i.e. fat is the most utilized body part (14 recipes), followed by oil (3) and skin (1) (Figure 3). The inhabitant use fat to treat snake bite, weakness, backbone pain, joint pain and eyes diseases (Figure 4). The existence of “omega-3 fatty acid” in “fat” that may engage healing diseases; as this is also helpful in aging affects, thrombotic, atherosclerosis and neurological disorder (Breteler, 2000; Kalmijn, 2000; Haag, 2003; Wilson, 2015).

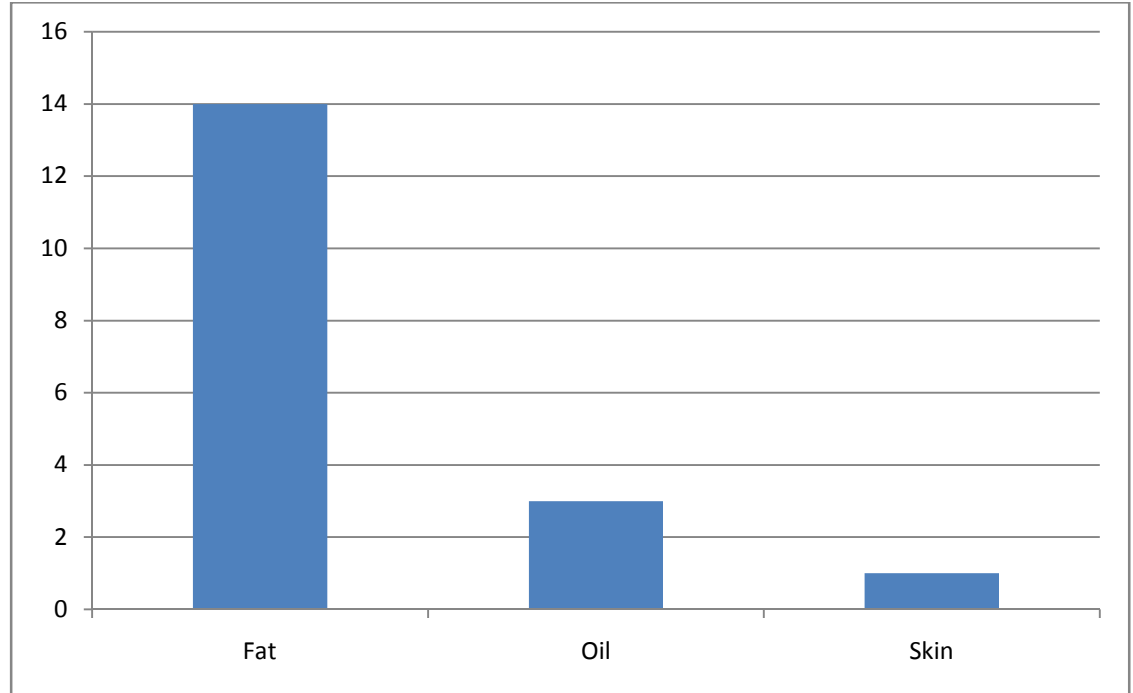


Figure 3: Body parts of animal species used in different recipes.

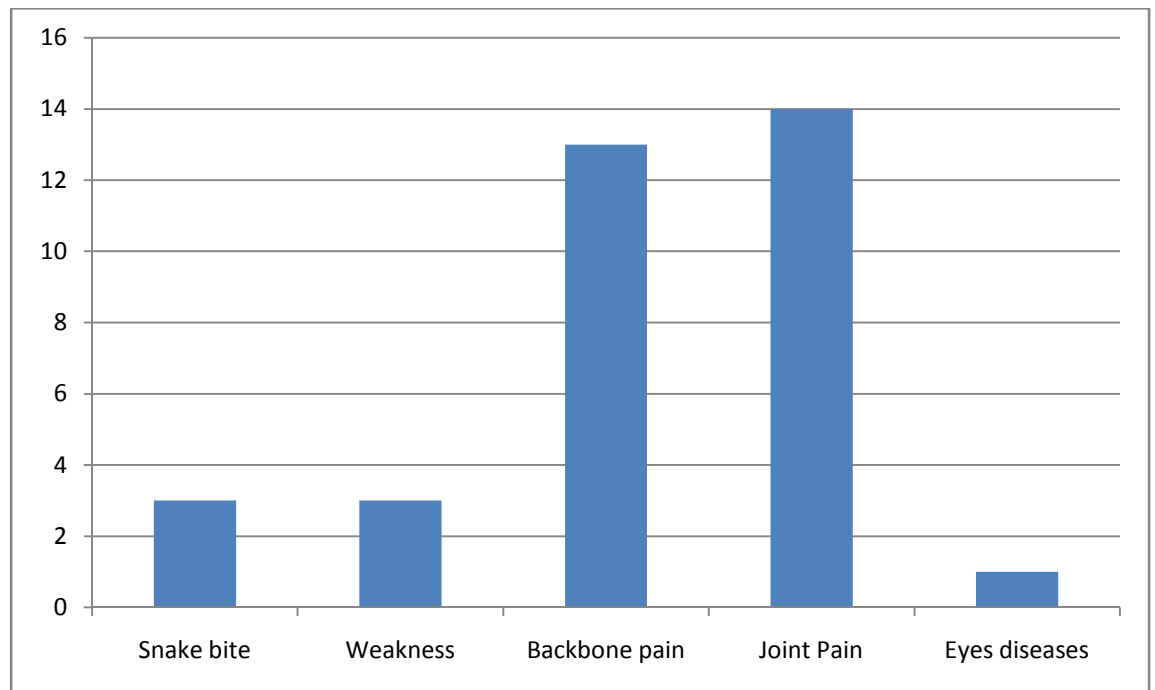


Figure 4: Number of herpetofauna species used to treat various diseases.

FREQUENCY OF CITATION (FC)

Herptile species, that were reported as regularly used to treat various ailments by the greatest number of respondents, had a high “FC” ranging from 1 to 22 (Table 2). With FC = 22, the Bengal monitor was reported as the most widely employed species

in various research locations for backbone pain and joint discomfort. With FC values of 19, 19, and 18, the brilliant ground agama, common tuberculated ground gecko, and Himalayan skink were also among the most widely utilized species.

USE VALUE (UV)

UV validates a species' relative value to a population. By examining the index in connection to the use categories, it was projected that this index would create a relationship between each herptile species and the uses shown to it. Table 2 shows a comparative examination of the use value of various herptile species across the groups living in the research region. Of the recorded herptile species, the Common krait and North-Pakistan Agama had the greatest usage values of 0.50, while Badkhashan rock agama had the lowest UVs of 0.22. The high UV levels of herptiles species attest to their continued usage in the treatment of different ailments. Furthermore, reference with the highest frequency of respondents as well as usage information demonstrating that herptile are widely used for therapeutic purposes in the research locations.

CONCLUSION

It is noted those inhabitants of study area were the main cause of declining of herpetofauna diversity and density. Human were destroying their habitats and killing them for different purposes. Many species of herpetofauna are important for traditional and herbal medicine.

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Table 2: The medicinal ethnopharmacological uses of amphibian and reptiles among the people of Dhirkot, Pakistan

Common name	PU=MA	Medicinal uses	Reported data	References	SI	FC	UR	RFC	UV
Common krait	O=T	Snake bite	Anti-venom	(Arshad <i>et al.</i> , 2014)	0	14	7	0.14	0.50
Oriental Garden Lizard	F=T	Weakness backbone pain and joint pain	Visual, joint pain	(Dixit <i>et al.</i> , 2010; Aloufi and Eid, 2016)	0.5	15	8	0.15	0.53
Russell's chain viper	O=T	Snake bite	Eye sight, urination, stool, flatus, anti- venom	(Benarjee <i>et al.</i> , 2010; Arshad <i>et al.</i> , 2014; Aloufi and Eid, 2016)	0	12	5	0.12	0.42
Fat tail gecko	F=T	Weakness backbone pain and joint pain			0	13	6	0.13	0.46
Himalayan pit viper	O=T	Snake bite			0	11	4	0.11	0.36
Brooke's house gecko	F=T	Backbone pain and joint pain			0	10	3	0.1	0.30
Yellow belly/common house gecko	F=T	Backbone pain and joint pain	Pain, vitiligo	(Aloufi and Eid, 2016; Borah and Prasad, 2017)	1	16	3	0.1	0.30
Agror agama / Monitor lizard	F=T	Weakness backbone pain and joint pain.	Joint pain, cough, fever, jaundice, burn, malaria, sexual stimulant, skin disease, arthritis,	(Padmanabhan and Sujana, 2008; Benarjee <i>et al.</i> , 2010; Chakravorty <i>et al.</i> , 2011; Lalmuanpuii <i>et al.</i> , 2013; Bagde and Jain, 2015; Borah and Prasad, 2017; Altaf <i>et al.</i> , 2018)	0.67	10	3	0.1	0.30
Badkhashan rock agama	F=T	Backbone pain and joint pain			0	9	2	0.09	0.22
Himalayan agama	F=T	Backbone pain and joint pain			0	7	2	0.07	0.29
North-Pakistan Agama	F=T	Backbone pain and joint pain	Healing, wounds	(Yeshe <i>et al.</i> , 2017)	0	8	4	0.08	0.50
Blue rock Agama	F=T	Backbone pain and joint pain			0	11	5	0.11	0.45
Himalayan skink	F=T	Backbone pain and joint pain			0	18	7	0.18	0.39

Brilliant ground agama	F=T	Backbone pain and joint pain			0	19	6	0.19	0.32
Bengal monitor	F=T	Backbone pain and joint pain	Malaria, jaundice, piles, arthritis, erectile dysfunction, muscular pain, fungal infection, virility	(Padmanabhan and Sujana, 2008; Benarjee <i>et al.</i> , 2010; Dixit <i>et al.</i> , 2010; Chinlapianga <i>et al.</i> , 2013)	0	22	9	0.22	0.41
Chekered Keelback	F=T	Backbone pain and joint pain			0	8	3	0.08	0.38
Common tuberculated ground gecko	F=T	Joint pain			0	19	5	0.19	0.26
Brown cobra	S=T	Eyes diseases	Visual illnesses	(Aloufi and Eid, 2016; Ajagun <i>et al.</i> , 2017)	1	1	3	0.01	0.30

Note: O (oil), T (topical), F (fat), S (skin), MA (mode of application), PU (parts use), SI (similarity index)