

Bioactive Terpenoids from the Kenyan Basidiomycota

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Outline

1. Sampling sites
2. *Antrodia* species
3. *Echinochaete brachypora*
4. *Heimiomyces* species
5. *Perenniporia centrali-Africana*

Kenya

Neighboring Countries: Sudan, Ethiopia, Somalia, Tanzania, Uganda, Rwanda, Burundi, DRC (Dem. Rep. of the Congo).

Major Cities: Nairobi (capital), Mombasa, Kisumu, Eldoret, Nakuru, Thika, Machakos, Garissa, Lamu, Malindi, Kilifi, Kwale, Taveta, Voi, Galana, Garsen, Hola, Kitui, Machakos, Namanga, Kisumu, Kakamega, Kitale, Lodwar, Moyale, Marsabit, Wajir, Mandera.

Geographical Features: Lake Victoria, Lake Albert, Lake Kyoga, Lake Edward, Lake Turkana (Lake Rudolf), Lake Naivasha, Lake Nakuru, Lake Malindi, Lake Jambasu, Lake Baringo, Lake Elmenteira, Lake Naivasha, Lake Nakuru, Lake Malindi, Lake Jambasu, Lake Baringo, Lake Elmenteira.

Mountains: Mt. Elgon (14,177 ft. / 4,321 m), Mt. Kenya (17,057 ft. / 5,199 m), Mt. Kilimanjaro (19,340 ft. / 5,895 m), Mt. Kulal (7,522 ft. / 2,293 m).

Deserts: Chalbi Desert.

National Parks and Reserves: Virunga National Park, Masai Mara Reserve, Amboseli National Park, Meru National Park, Tsavo National Park.

Water Bodies: Indian Ocean, Lake Victoria, Lake Albert, Lake Kyoga, Lake Edward, Lake Turkana (Lake Rudolf), Lake Naivasha, Lake Nakuru, Lake Malindi, Lake Jambasu, Lake Baringo, Lake Elmenteira.

Coordinates: 30° E, 34° E, 38° E, 42° E, 4° N, Equator 0°, 4° S.

Scale: 0 to 100 Miles, 0 to 100 Kilometers.

Map Source: MAPQUEST.

Kakamega Forest



Mt. Elgon National Reserve



Arabuko Sokoke



View over the canopy
© Ariadne van Zandbergen

Antrodia species



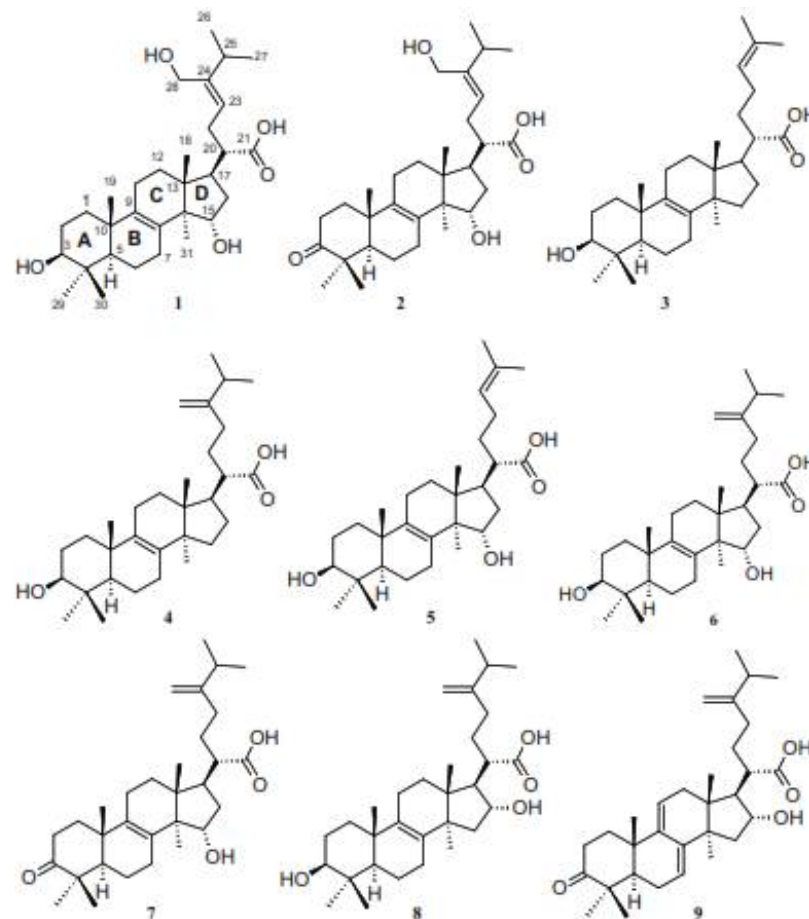
- This species was collected from Mt. Elgon Forest in 2016.
- The taxonomy of this strain is still unclear.
- Many of the tropical species of *Antrodia* and allied genera from Africa are yet to be characterized by modern taxonomic methods.

Article

Neurotrophic and Immunomodulatory Lanostane Triterpenoids from Wood-Inhabiting Basidiomycota

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- The progressive death of **neuronal cells** as a result of **neurodegenerative diseases** is posing a severe problem to the aging population
- Neurotrophins play an important role in the central nervous system.
- Compounds that enhance neurotrophins are **potential therapeutic drugs** for treatment of neurodegenerative diseases like Alzheimer and Parkinson.
- These lanostane triterpenoids were found to enhance the neurotrophins nerve growth factor (ngf) and brain derived growth factor (bndf).
- **This is the first report of lanostanes in relation to the enhancement of ngf and bndf.**



Echinochaete brachypora

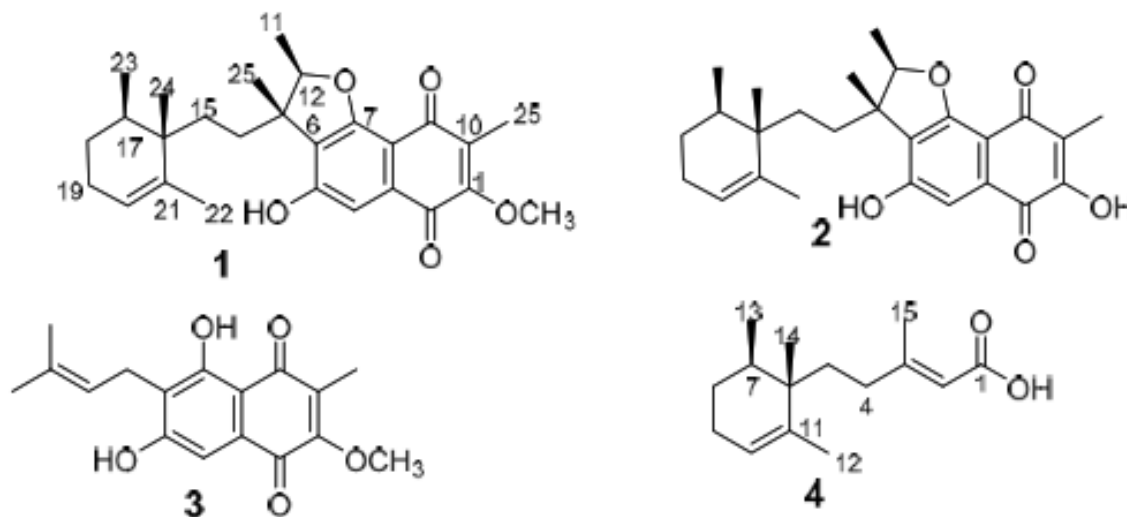


- Collected from Mt. Elgon Forest in 2016 and 2017.
- The species genus *Echinochaete* are mainly distributed in tropical and sub-tropical regions of the world.
- So far no secondary metabolites have been reported from this genus.
- There are six known species that belong to this genus:
 - *E. maximipora*
 - *E. cinnamomeosquamulosa*
 - *E. ruficeps*
 - *E. russiceps*
 - *E. megalopora*
 - *E. brachypora*

Article

Meroterpenoids Possibly Produced by a Bacterial Endosymbiont of the Tropical Basidiomycete *Echinochaete brachypora*

Khadija Hassan ^{1,2}, Clara Chepkirui ^{1,3}, Natalia Andrea Llanos-López ^{1,2}, Josphat C. Matasyoh ⁴, Cony Decock ⁵, Yasmina Marin-Felix ^{1,2,*} and Marc Stadler ^{1,2,*}



- These type of compounds (neomarinone and its derivatives) had previously only been isolated from an Actinobacteria. The question then was, **Does the fungus produce these metabolites itself or it has a symbiont?**
- The fungal mycelia showed the presence of the bacterial 16SrDNA.
- Metabolites production stopped when the fungus was sub-cultured on a medium containing antibacterial antibiotics.

Heimiomyces species



- The strain *Heimiomyces* sp. was collected from Mount Elgon National Reserve in Kenya.
- It was identified as *Heimiomyces* sp. by comparison of morphological characteristics and sequencing of the 5.8S/ITS nrDNA.
- This species was found to have a very diverse secondary metabolites profile.

Calamene-Type Sesqui-, Mero-, and Bis-sesquiterpenoids from Cultures of *Heimiomyces* sp., a Basidiomycete Collected in Africa

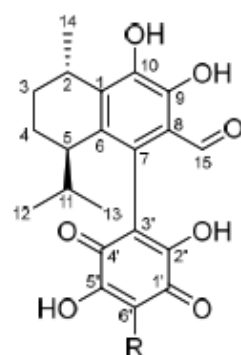
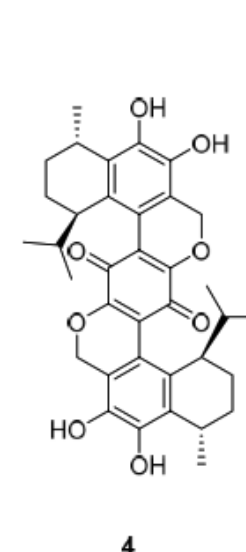
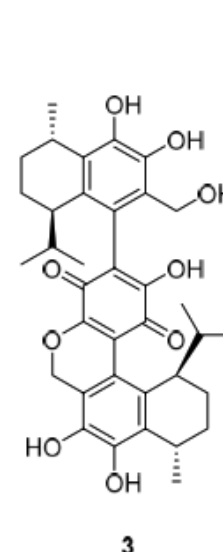
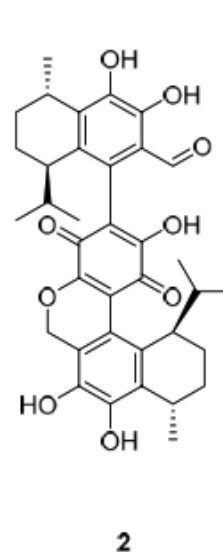
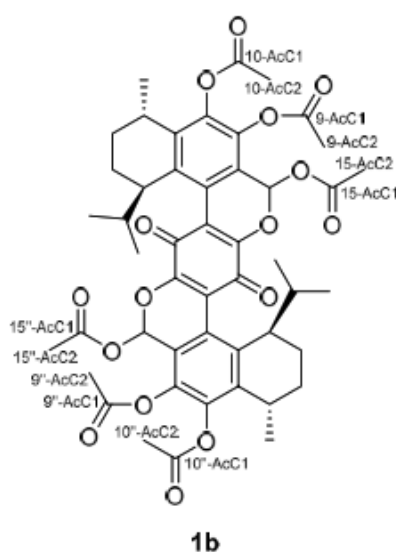
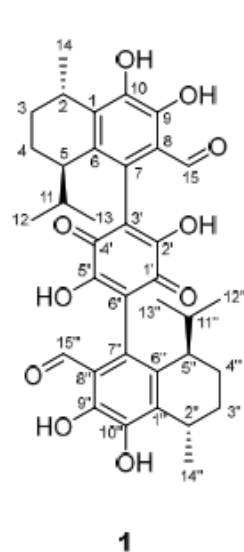
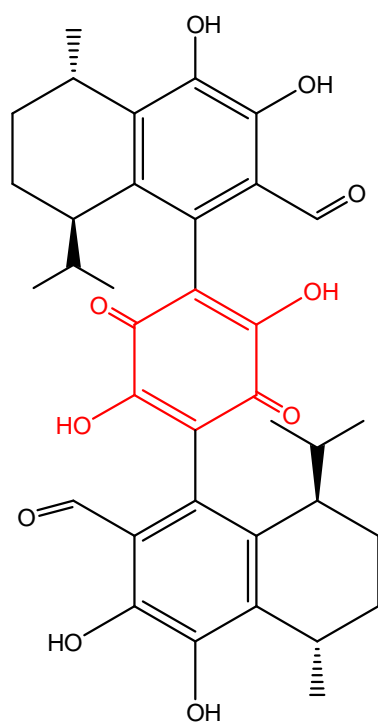
Sebastian Pfütze, Atchara Khamsim, Frank Surup, Cony Decock, Josphat C. Matasyoh, and Marc Stadler*



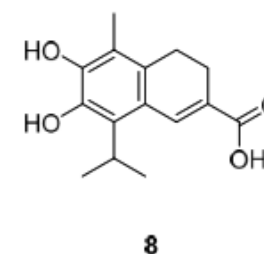
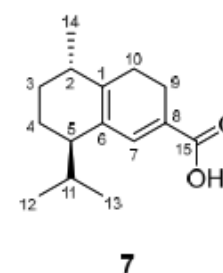
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5: R = CH₃
6: R = H






Perenniporia centrali-africana

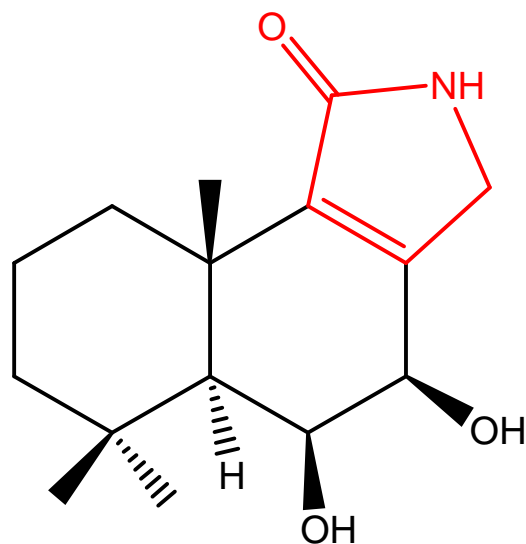


- The strain *Perenniporia centrali-Africana* was collected from Mount Elgon National Reserve in Kenya 2016.

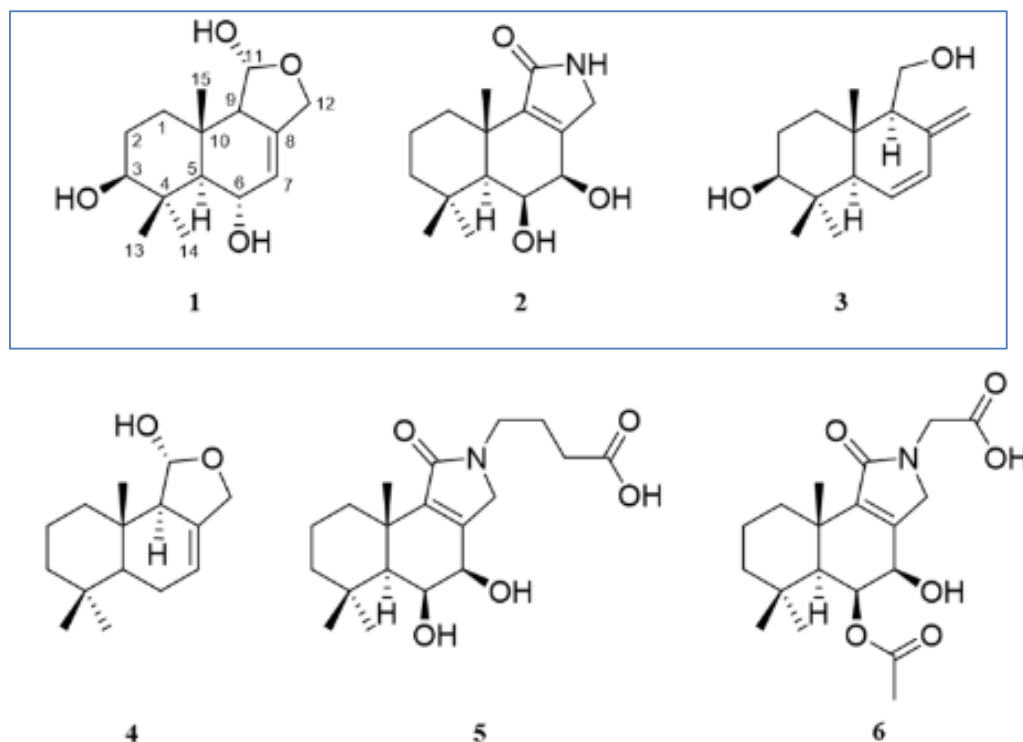
Article

Drimane-Type Sesquiterpenoids Derived from the Tropical Basidiomycetes *Perenniporia centrali-africana* and *Cerrena* sp. nov

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The first of drimane type sesquiterpene lactams



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