

A NEW GENUS, SPECIES, AND SUBTRIBE OF TERMITOPHILOUS STAPHYLINIDAE FROM AUSTRALIA (Coleoptera)

With a Description of its Glands¹

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Abstract: Two new species, *Nasutiphilus flavus* and *N. niger*, are described from Australia. These belong to the new genus *Nasutiphilus* and new subtribe, *Nasutiphilina*, respectively. Both species were found with the termite, *Nasutitermes exitiosus*. Studies of the gland systems would lead me to predict that these species are not closely integrated into the social life of the termites. The large mandibles would seem to indicate that they are predators.

Among recent collections of termitophiles collected by F. J. Gay were 2 new species of what proved to be a new genus. This genus is related to *Atheta* Thompson but easily separated therefrom by the shapes of the pronotum, legs, and abdominal segment IX. The genus is distinctive enough to make up a new subtribe of the tribe Athetini. It is the purpose of this paper to describe the new genus, the 2 new species, and the new subtribe.

Included in the material were several large series preserved in alcoholic Bouin's fluid which could be meaningfully sectioned and studied for evidence of gladar structures. The results of this study are included in a section after the descriptions.

The methods employed in this study are given by Kistner (1968) and Kistner & Pas-teels (1969). All measurements are given in millimeters, unless otherwise stated.

Acknowledgments: I wish to thank F. J. Gay, Department of Entomology, Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra, for sending me the specimens contained herein for study and for providing the host determinations. I also wish to thank A. E. Emerson, University of Chicago, for reading and commenting on this paper. The initials in parentheses above will be used to indicate deposition of the specimens studied. Specimens retained in my collection will be predicated (DK).

Thanks are given to the following Shinner Assistants for help with various aspects of this paper: James Clover, Margaret Enger, Lynette Hawver, Robert Palmer, Norris Sadler, and Karen Wells, all from Chico State College.

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1. This study was financed in part by the U. S. National Science Foundation (Grant GB-12668) and completed during the tenure of a Chancellor's Leave for Research or Special Creative Activities granted by Chico State College.
 2. Shinner Institute for the Study of Interrelated Insects, Department of Biology, Chico State College, Chico, California 95926.

Subtribe *Nasutiphilina* Kistner, new subtribe

Distinguished from all the other subtribes of the tribe Athetini by the shape of abdominal segment IX and the shape of the legs.



Fig. 1. Dorsal appearance of entire beetle, *Nasutiphilus niger*.

The characters held in common by the present 2 species of this subtribe are the broad pronotum shaped as in fig. 1 as well as the generalized shape of abdominal segment IX which is in the ♂ shaped as in fig. 3F with long asymmetrical apodemes in the ♂ as well as a sternite IX. In the ♀, these long apodemes are absent as well as the sternite IX and the whole complex is shaped as in fig. 3C. The lateral lobes of the ♂ genitalia usually have subtribal characters but these have not been sufficiently published for comparison; in both of these species the lateral lobe is shaped as in fig. 4C.

Genus *Nasutiphilus* Kistner, new genus

Closely related to *Atheta* from which it is distinguished by the shape of abdominal IX as well as the shape of the mandibles. A highly distinctive genus which is presently represented only by species in Australia.

Overall shape as in fig. 1. Head capsule wider than long with a distinct nuchal suture and a distinct vertexal arcade which is produced right behind the clypeus. Clypeus turned down at an angle with vertex to make antennal sockets open anteriorly instead of dorsally. Capsule otherwise oval in shape

and without a distinct neck. Antennae 11-segmented, shape somewhat variable by species (fig. 3A and 3B). Antennae inserted between eyes very close to insertion of arms of anterior tentorium. Gula relatively long with sides diverging from anterior to posterior. Submentum broadly expanded anteriorly. Mentum distinct from submentum, shaped as in fig. 2C and 2F; with median teeth. Maxillae shaped as in fig. 2D; palpi 4-segmented. Maxillary acetabulae distinctly margined. Labium shaped as in fig. 2H; palpi 3-segmented. Labrum shaped as in fig. 2G.

Pronotum wider than long, shaped as in fig. 1 with rounded anterior corners and double sinuate posterior border. Prosternum relatively short (0.07), evenly rounded dorsoventrally and with no carinas of any kind; anterolateral articulation processes of normal length. Procoxal cavities closed behind by membrane in which are located the very narrow strap-like mesothoracic peritremes. Elytra without distinction, shaped as in fig. 3D. Wings present, of normal size, and with usual staphylinid venation. Metasternum about 2× length of mesosternum; both of normal length. Mesocoxal acetabulae completely margined. Mesosternal intercoxal process

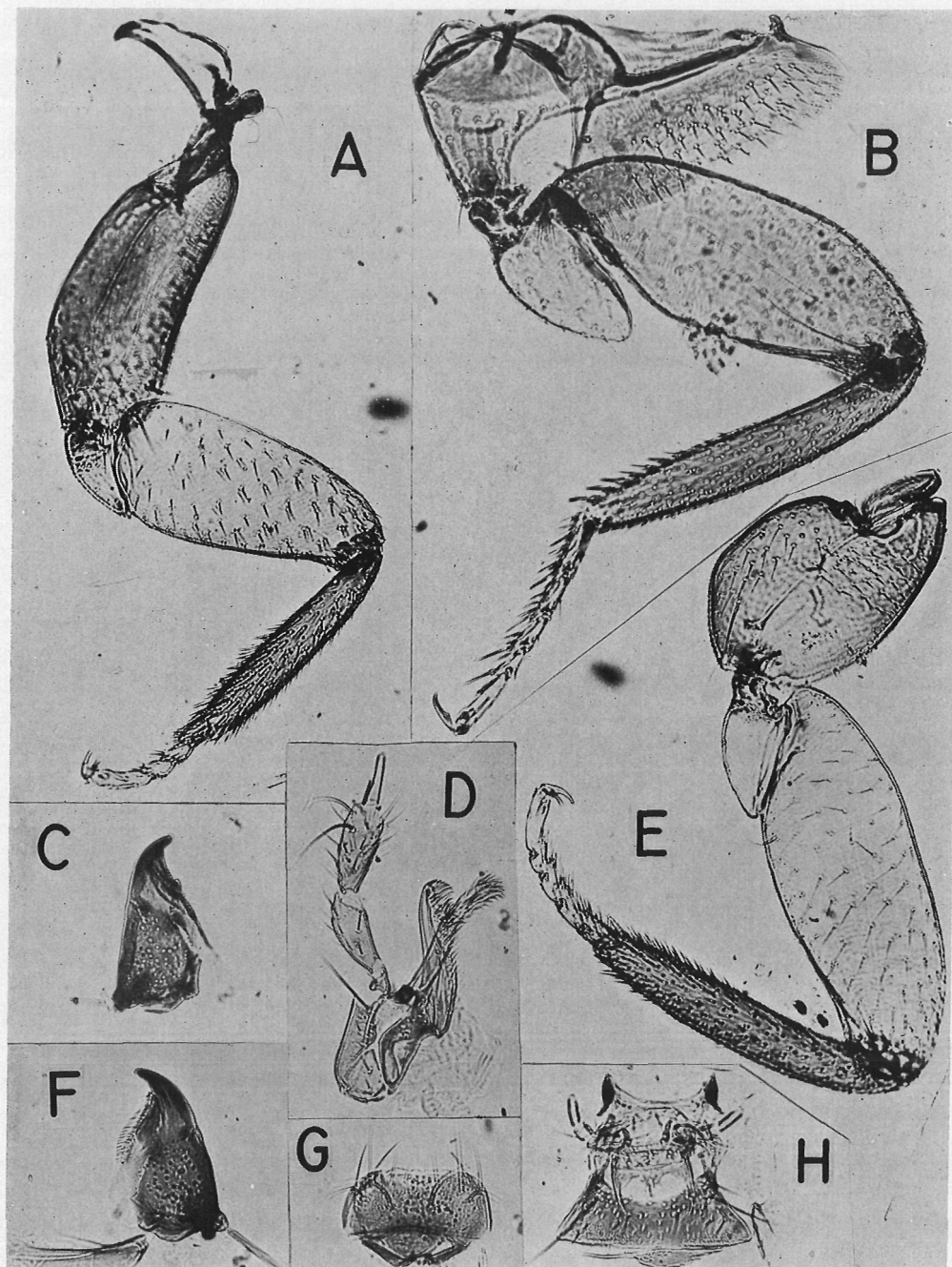
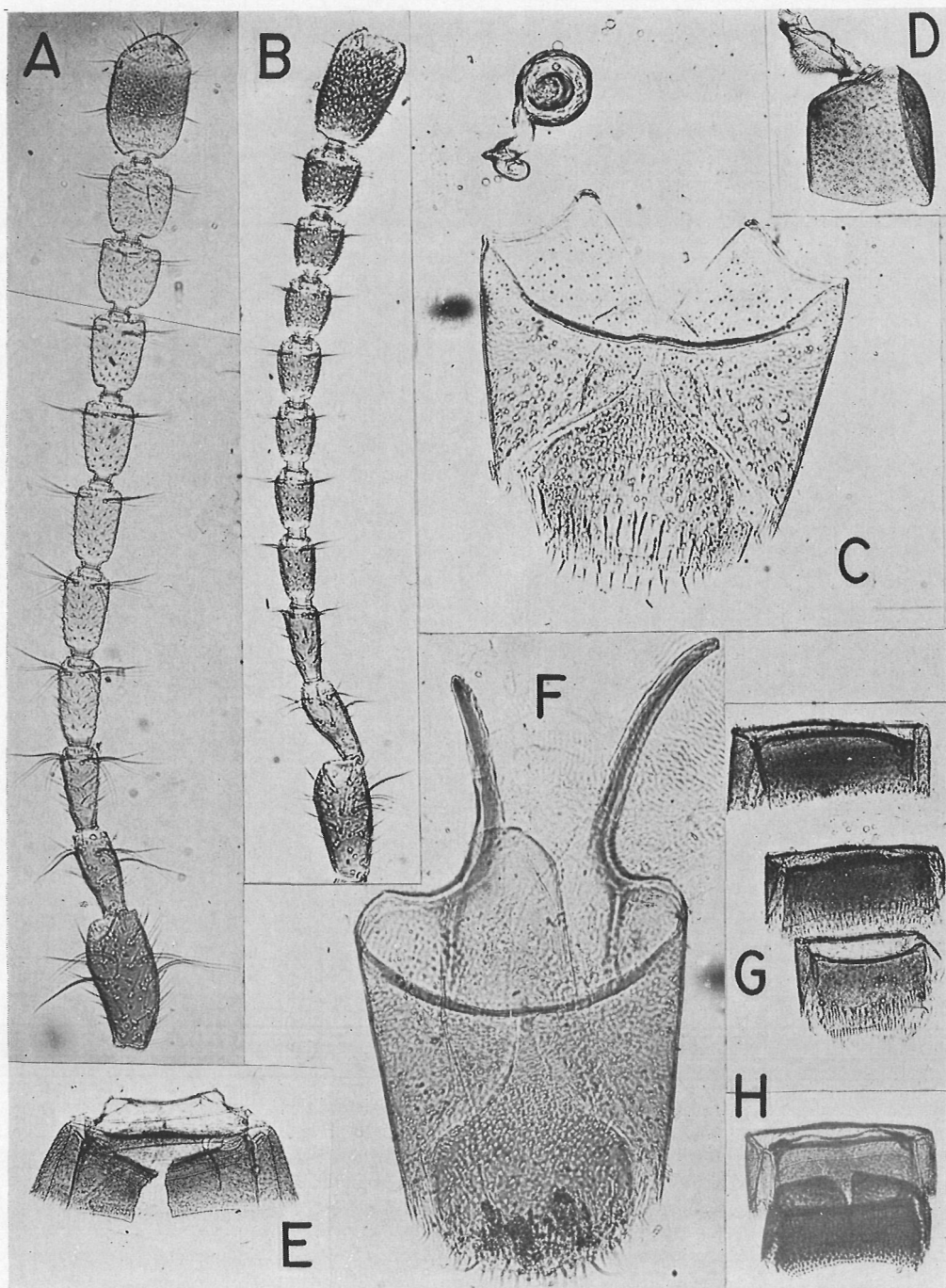


Fig. 2. *Nasutiphilus flavus*: A, proleg; B, metaleg; C, right mandible; D, maxillae; E, mesoleg; F, left mandible; G, labrum and mentum; H, labium and submentum.



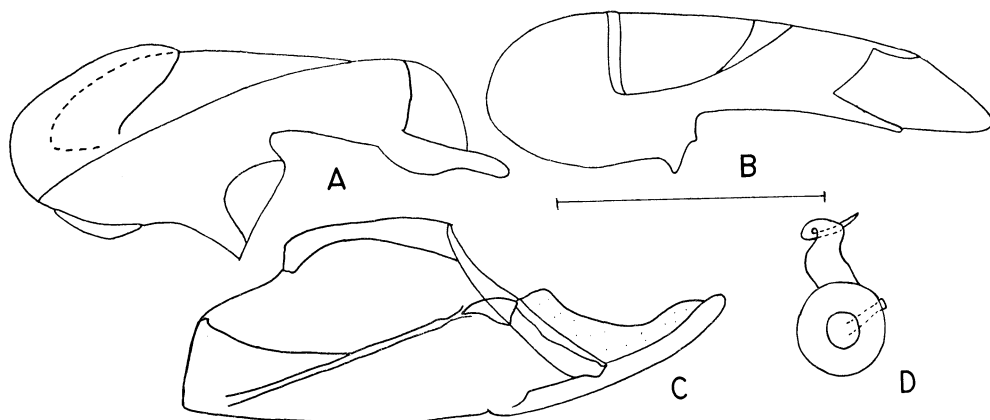


Fig. 4. Median lobes of ♂ genitalia: A, *Nasutiphilus flavus*; B, *N. niger*. Lateral lobe of ♂ genitalia: C, *N. flavus*. Spermatheca: D, *N. flavus*. (Scale represents 0.25 mm and applies to all figures).

Notes: The hosts of all the specimens were determined to be *Nasutitermes exitiosus* (Hill) by F. J. Gay and J. H. Calaby. Specimens of the host termites are in the Australian National Insect Collection, CSIRO, Canberra.

***Nasutiphilus flavus* Kistner, new species** Fig. 2; 3A, D, E, F, H; 4A, C, D.

Most closely related to *Nasutiphilus niger* from which it is distinguished by its lighter color, its longer antenna, and the shape of the median lobe of the ♂ genitalia.

Color yellowish brown to light reddish brown throughout, pronotum somewhat lighter than head, elytra usually somewhat lighter than pronotum, always lighter than head. Dorsal surface of head, pronotum, and abdomen covered with a sparse covering of fine yellow setae. Surface of body otherwise lacking any macrosetae. Abdominal segment IX also lacking black setae. Antennae relatively long, shaped as in fig. 3A. Median lobe of ♂ genitalia shaped as in fig. 4A. Spermatheca shaped as in fig. 4D.

Measurements: Head length, 0.31-0.33; pronotal length, 0.50-0.58; elytral length, 0.42-0.46. Number measured, 10.

Holotype (No. 13760), Australia, Australian Capital Territory, Canberra, Black Mountain, 3.III.1961, F. J. Gay (ANLC, CSIRO, Canberra)

Paratypes: Australia: 3, same data as holotype (CSIRO, DK); 57, A.C.T., Canberra, X.1947, F. J. Gay (CSIRO, DK); 37, A.C.T., Canberra, Black Mountain, 10.VII.1969, F. J. Gay (CSIRO, DK); 1, A.C.T., Canberra, Black Mountain, 19.VI.1969, F. J. Gay (CSIRO); 12, A.C.T., Downer, 14.II.1961 J. H. Calaby (CSIRO, DK); 26, New South Wales, 8 km (5 mi) E of Michaelago, 17.VII.1969, F. J. Gay (CSIRO, DK).

Notes: The hosts of all the specimens were determined to be *Nasutitermes exitiosus* (Hill) by J. H. Calaby and F. J. Gay. Specimens of the host are in the Australian National Insect Collection.

acute and acarinate. Pro-, meso-, and metalegs shaped as in fig. 2A, 2E, and 2B, respectively; tarsal formula 4-5-5.

Abdomen not physogastric, shaped as in fig. 1. Segment I represented only by tergite fused to metanotum. Segment II represented only by a tergite. Segments III-VII with 1 tergite, 1 sternite, and 2 pairs of paratergites each, as in fig. 3E, 3G, and 3H. Dorsal rim of abdomen formed between outer paratergites and sternites. Abdominal segment VIII with 1 tergite and 1 sternite only. Segment IX trilobed shaped as in fig. 3C and 3E, anterior apodemes of ♂ extremely conspicuous and asymmetrical, shaped as in fig. 3F. Female spermatheca present, shape variable by species. Median lobe of ♂ genitalia bulbous, shape variable by species. Lateral lobe of ♂ genitalia shaped as in fig. 4C.

Type-species: *Nasutiphilus niger* n. sp.

KEY TO SPECIES OF NASUTIPHILUS

1. Color dark reddish brown, antennae relatively short (fig. 3B), median lobe of ♂ genitalia shaped as in fig. 4B **niger**
- Color yellowish brown, antennae relatively long (fig. 3A), median lobe of ♂ genitalia shaped as in fig. 4A **flavus**

Nasutiphilus niger Kistner, new species Fig. 1; 3B, C, G; 4B; 5.

Most closely related to *Nasutiphilus flavus* from which it is distinguished by its color, the shape and length of the antenna, and the shapes of the ♂ genitalia and spermatheca.

Color reddish brown throughout, pronotum and abdomen usually somewhat lighter than rest of body, in any event lighter than head and antenna. Dorsal surface of head, pronotum, elytra and abdomen covered with many short fine setae. No macrochaetae present on any part of body, although some longer setae are present on tergite of abdominal segment IX. Antennae relatively short, shaped as in fig. 3B. Spermatheca shaped as in fig. 3C. Median lobe of ♂ genitalia shaped as in fig. 4B.

Measurements: Head length, 0.30-0.32; pronotal length, 0.55-0.58; elytral length, 0.40-0.44. Number measured, 10.

Holotype (No. 13758), Australia, Australian Capital Territory, Canberra, Black Mountain, 7.V.1952, F. J. Gay. In the Australian National Insect Collection, CSIRO.

Paratypes: Australia: 25, same data as holotype (CSIRO, DK); 11, A.C.T., Downer, 20.II.1961, J.H. Calaby (CSIRO, DK); 2, A.C.T., Canberra, X.1947, F.J. Gay (CSIRO, DK); 2, A.C.T., Black Mountain, 3.III.1961, F.J. Gay (CSIRO, DK); 1, A.C.T., Canberra, 12.XI.1965, F.J. Gay (CSIRO); 12, New South Wales, 58 km (5 mi) E of Michaelago, 17.VII.1969, F.J. Gay (CSIRO, DK).

Fig. 3. *Nasutiphilus flavus*: A, antenna; D, elytron; E, abdominal segment II and III; F, abdominal segment IX of ♂; H, abdominal segment IV and V. *N. niger*: B, antenna; C, abdominal segment IX of ♀ and spermatheca; C, abdominal segments VI, VII, and VIII.

SOME ASPECTS OF THE GLANDULAR SYSTEM OF NASUTIPHILUS

Because some specimens of both species were preserved in alcoholic Bouin's fluid, meaningful studies could be made of the glandular system. No differences in the gland system between the species were observed. All of the photographs given were taken from specimens of *N. niger* because the staining preparations turned out better in that species.

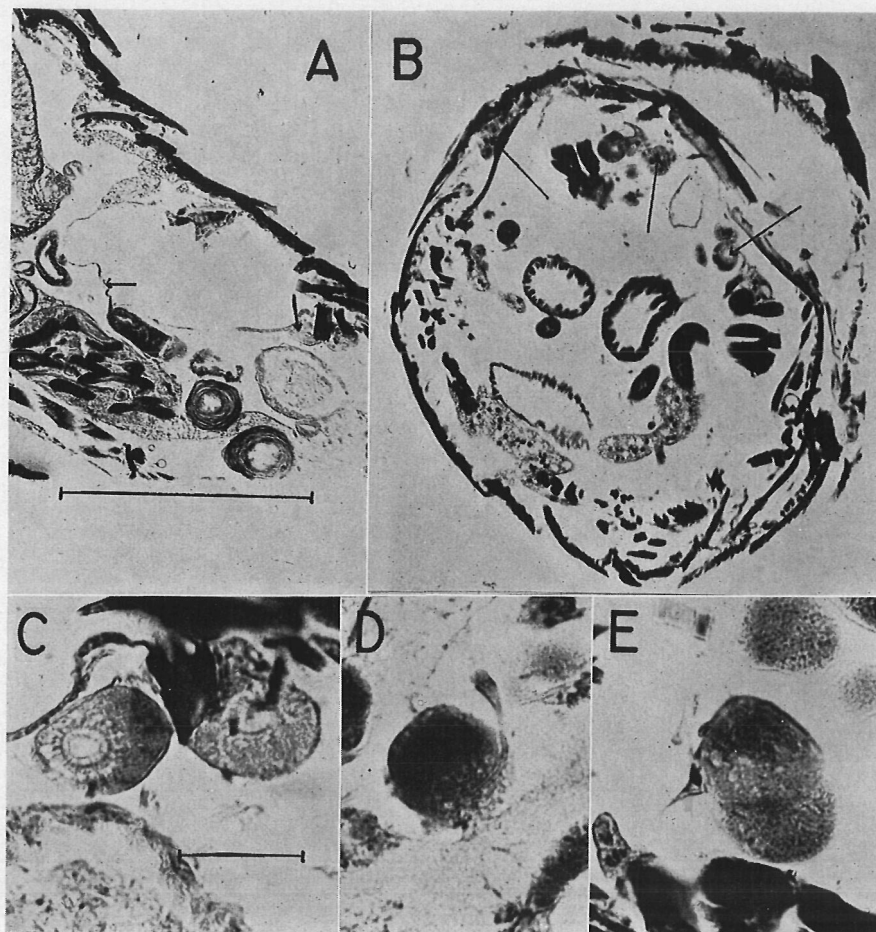


Fig. 5. *Nasutiphilus niger*: A, posterior abdomen, longitudinal section showing extensive defense gland reservoir (left arrow) as well as a few gland cells (right arrow); B, posterior abdomen, parasagittal section showing bilateral distribution of gland cells (right arrows) as well as a few type 2 gland cells (left arrow); C, defense gland cells showing cell reservoir surrounded by microvilli; D, E, defense gland cells emphasizing canaliculi. Preparations in fig. A-C were stained with Azocarmine-Alanine Blue-Orange G. Preparations in fig. D and E were stained with alcoholic Hematoxylin. (Scale under fig. A represents 0.25 mm and applies to fig. A and B. Scale in fig. C. represents 0.05 mm and applies to fig. C-E.

The most conspicuous gland in the beetle is the tergal defense gland located under abdominal tergite VI. This gland consists of clusters of gland cells arranged bilaterally (see fig. 5B) toward the posterior of a very large reservoir in this genus (see fig. 5A). These gland cells have internal cellular reservoirs surrounded by microvilli (fig. 5C) and have canaliculi as shown in fig. 5D and 5E which connect the cells to the reservoir. The reservoir empties by way of 2 large openings at the anterior of tergite VII (fig. 3G).

Hypodermal gland cells of type 1 and type 2 are present in this genus (fig. 5B), but they are very infrequent compared to genera like *Skatitoxenus* (Kistner & Pasteels 1969) or *Trichopsenius* (Pasteels & Kistner 1970).

Because of the very large tergal defense gland and reservoir and the sparse distribution of type 1 and type 2 gland cells, it is doubtful whether this genus is very well integrated into the termite society. The large mandibles would seem to indicate that it was a predator. These ideas should be tested by laboratory and field observations of course before they are accepted as fact.

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