

Trichodamon Mello-Leitao and the Damonidae, New Family status (Amblypygi:Arachnida)

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Summary

The subfamily Damoninae Simon, 1936 is elevated to the family level to correspond with the Phrynidae Pocock, 1902 and the Phrynichidae (= Phrynichinae Simon, 1892). A revision of the generic characters within the Damonidae reveals only three valid genera, *Nanodamon* Pocock is placed in synonymy with *Damon* C. L. Koch, and a key for the known genera is presented. New characters are described and illustrated from the type material and new collections of *Trichodamon froesi* Mello-Leitao.

A new key to the species of *Trichodamon* is given. Present evidence suggests that of the three non-pulvillated families of amblypygids, the Damonidae exhibit a closer relationship with the Phrynichidae than with the Phrynidae.

Introduction

Except for doubtful records of *Damon variegatus* (Perty) from the Amazon and of *Damon australis* Simon, 1886 from Patagonia, the first sound record of a member of the family Damonidae in America was given by Mello-Leitao in 1935 when he described *Trichodamon princeps*, new gen., n. sp. from the Brazilian Highlands. In 1936 Mello-Leitao described an immature of *T. princeps* as *T. pusillus*, but following Fage's suggestion (1939), M.-Leitao recognized his error and synonymized *T. pusillus* under *T. princeps*, the adult. In the same paper, M.-L. described a new species, *T. froesi* M.-L., 1940.

Since these publications there have been no additional records of *Trichodamon*. After examining a small collection of *Trichodamon froesi* from Januaria, Minas Gerais, Brazil (NEW RECORD) I found the characters used by Mello-Leitao unsatisfactory and decided to prepare the present revision.

Family Damonidae

Damoninae Simon, 1936, *Mém. Mus. natn. Hist. nat., Paris* 4: 294. Simon does not give the name Damoninae but reading his paper it is clear that Simon considers *Damon* C. L. Koch, 1850 as the type genus of a subfamily. Millot, 1949, *Traité de Zoologie*, Masson 6: 585 refers Damoninae to Simon; 1936.

Diagnosis: Amblypygids without pulvillus on the tarsi of legs 2 to 4; with the tibia of leg 4 divided into three segments; with the proximal cusp of the proximal tooth on medial edge of the basal segment of the chelicerae being larger than the distal cusp (Fig. 1, arrow) on the same tooth, and with group rbc (baso-caudal row) of trichobothria hairs on the distitibia of leg 4 (Fig. 5).

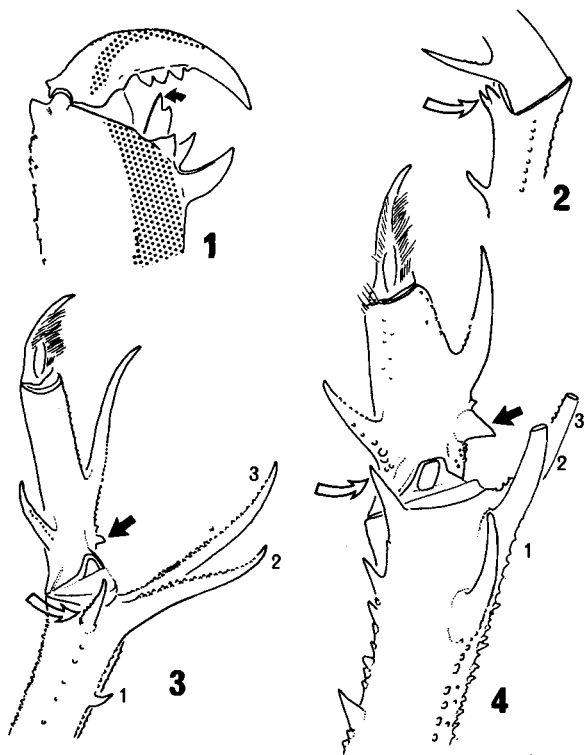
Type Genus: *Damon* C. L. Koch, 1850.

Key to damonid genera, their type species indicated:

- 1a. Only one spine present on ventral distal end of pedipalp tibia; below long dorsal spine of pedipalp basitarsus (hand), one short thick tubercle (Fig. 3) *Trichodamon* Mello-Leitao 1935
 type species: *T. princeps* M.-L. 1935
- 1b. Two or more spines on ventral distal end of pedipalp tibia (Figs. 2, 4); below long dorsal spine of pedipalp basitarsus, a shorter, well developed spine (Fig. 4) 2
- 2a. Spine at ventral distal end of pedipalp tibia is undivided *Damon* C. L. Koch, 1850
 type species: *D. variegatus* (Perty, 1834)
- 2b. Bifurcated spine at ventral distal end of pedipalp tibia (Fig. 2) *Musicodamon* Fage, 1939
 type species: *M. atlanteus* Fage, 1939

Recognizable genera and species in Damonidae:

In 1894 Pocock described two new genera, *Titanodamon* (type *T. johnstonii* Poc. 1894) and *Nanodamon* (type *N. annulatipes* (Wood, 1869) based on the presence or absence of the ventral sacs on the posterior edge of the second abdominal sternite. These abdominal ventral sacs were absent from *Nanodamon* and present in *Titanodamon*. Kraepelin (1899) synonymized both genera with *Damon* C. L. Koch, recognizing only two species of *Damon*: *D.*



Figs. 1 & 3: *Trichodamon froesi* M.-L. 1 External face of right chelicera, dotted area represents area of hairs. 3 Ventro-medial view of tarsus and distal end of pedipalp tibia; spines 1-3 are on dorsal edge of pedipalp tibia.

Fig. 2: *Musicodamon atlanteus* Fage. Pedipalp basitarsus and tibia, ventral view.

Fig. 4: *Damon medius* (Herbst) from Ganta, Liberia. Tarsus and tibia of pedipalp ventral view. Spines 1-3 on dorsal edge of pedipalp tibia.

medius (Herbst, 1797) and *D. variegatus* (Perty, 1834). Fage (1939) removed *D. diadema* from synonymy under *D. variegatus* and recognized three species as valid: *D. diadema* Simon, 1876, *D. medius* and *D. variegatus*. Fage recognized *Titanodamon* Poc. 1894 as a genus with a forward directed frontal process, rounded at its end, and with numerous hairs in longitudinal series on the internal (medial) face of the basal cheliceral segment. Fage lists two species: an

immature, *Titanodamon australis* (Simon) and *T. johnstonii* (Pocock). I have examined the type material of both species and consider that the generic characters given by Fage are specific characters which tend to vary with the age of the animals. Thus it is no longer useful to retain *Titanodamon* as a generic name. For this reason, I replace *Titanodamon* on synonymy under *Damon* C. L. Koch, as Kraepelin did in 1899, accepting the synonymy given by Kraepelin under species.

As in the Phrynidae, different genera are separated primarily by distinctions in the main spines of the pedipalp tibia. In the Phrynidae the spines considered are the dorsal spines, while in the Damonidae they are the spines on the ventral side of the pedipalp tibia.

I have not used the absence of a second, basal dorsal spine on the pedipalp basitarsus to separate *Trichodamon* from the other two genera because, as Fage pointed out (1939, p. 110): "Cette second épine peut manquer ou être seulement indiquée par un faible tubercle chez le jeunes individus des autres espèces".

The external morphology of the male genitalia, (Figs. 10-11) although lightly sclerotized and thus subject to shape distortions, appears to present interesting and constant differences that could be used in future revisions to tell species apart. The female genitalia (Fig. 9) provide fewer discrete differences between species. I have used the same nomenclature for the external parts of the male genitalia (Fig. 10) as proposed by Weygoldt (1972) for *Charinus* species. The homologies cannot clearly be established, but it is useful to apply the same terms for analogous structures in amblypygid groups. The same applies to the nomenclature employed for the trichobothria hairs, as suggested by Weygoldt (1970) for *Phrynus marginemaculatus* C. L. Koch.

Musicodamon atlanteus Fage, 1939 is the only species within the family with clavate setae on the inner lateral surface of the basal cheliceral segment, probably functioning for stridulation. These clavate setae are not a generic character *per se*, as suggested by Fage, but a specific character. They are known from *Paraphrynus astes* Mullinex, 1975 and *Acanthophrynus coronatus* (Butler, 1813) in the Phrynidae and in all the species of the Phrynichidae.

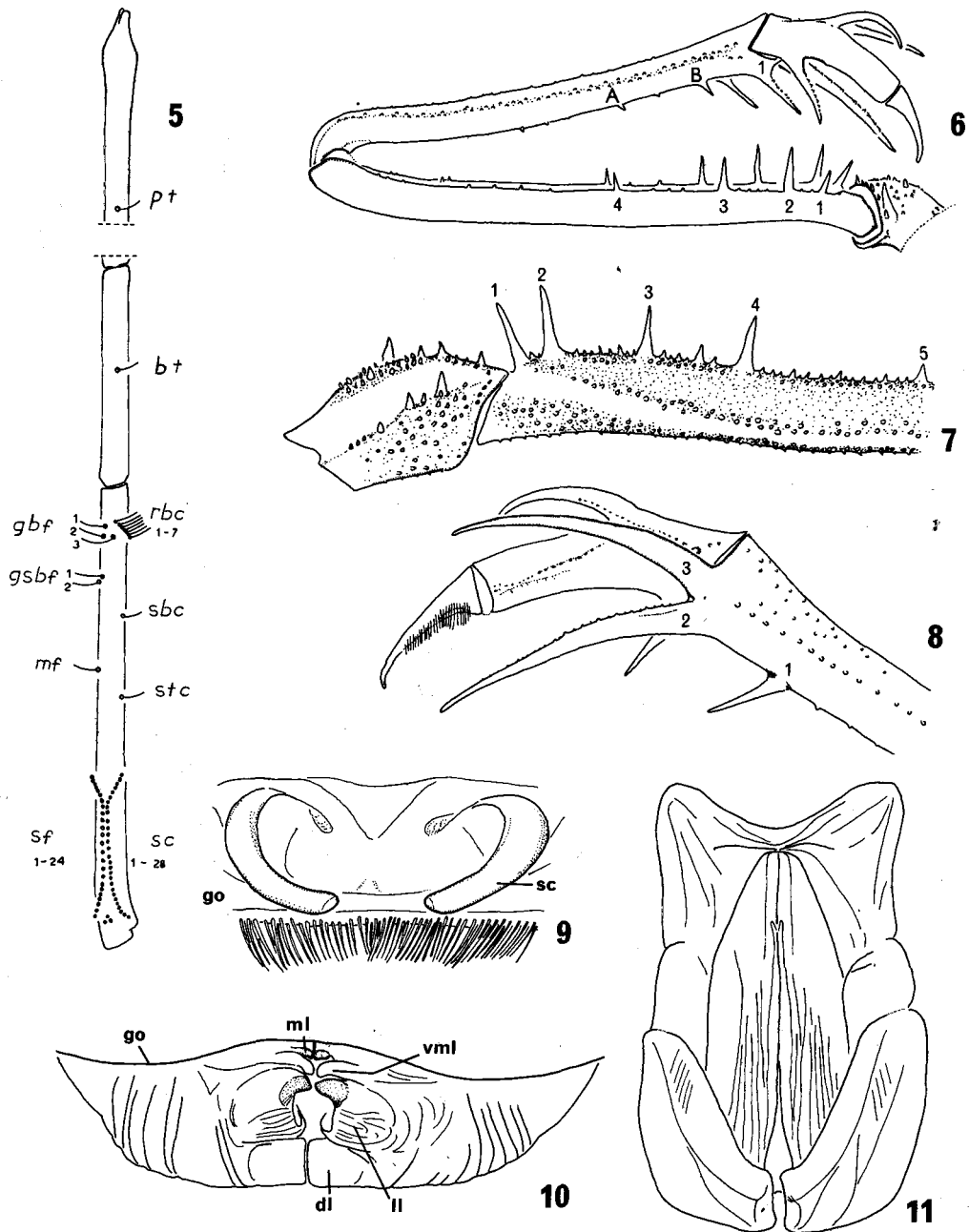


Fig. 5-11: *Trichodamon froesi* M.-L. Drawings at different magnifications. 5 Leg 4, tibia, pt, proximo-tibial; bt, baso-tibial; rbc, baso-caudal row; gbf, baso-frontal group; gsbf, sub-basal frontal group; mf, meso-frontal; sf, frontal series; sbc, sub-basal caudal; stc, sub-terminal caudal; sc, caudal series. 6 Ventral view, right pedipalp, syntype young male. 7 Dorsal view, pedipalp trochanter and femur, syntype young male. 8 Dorsal view, pedipalp tarsus and tibia, syntype female. 9 Dorsal view, female genitalia. go, genital operculum; sc, sclerite. 10 Posterior view, male genitalia. go, genital operculum; ml, median lobe; vml, ventro-median lobe; dl, dorsal lobe; ll, lateral lobe. 11 Dorsal view, male genitalia.

Genus *Trichodamon* Mello-Leitao

Diagnosis: *Trichodamon* is the only genus in the family with a single distal spine on the ventral side of the pedipalp tibia. It has the rbc of the trichobothria on the distitibia IV with the largest number of hairs.

Key to species of Trichodamon:

- 1a. Ratio of medial prosomal length over prosomal width, larger than 0.70; upper cheliceral segment with four teeth about equal in size; legs unicolourous *T. princeps* M.-L., 1935
 (= *T. pusillus* M.-L., 1936)
- 1b. Ratio of medial prosomal length over prosomal width, less than 0.70; upper cheliceral segment with three teeth, the basal being the largest (Fig. 1); legs banded *T. froesi* M.-L., 1940

Type Material: I was not able to locate the type material of *T. princeps* either at the Instituto Butantan of São Paulo nor at the Rio de Janeiro Museum. Thus the observations on *T. princeps* are based on M.-Leitao measurements and records. *T. princeps* was reported by M.-L. from the following material from the State of Goiás, Brazil: one male, Nova Roma (1935); female and immature, Canna Brava (1936).

The syntype material of *T. froesi* M.-L., 1940 was found at the Rio de Janeiro Museum, consisting of two males and one female coll. by Dr H. Froes at the Mangabeira Caves in the State of Bahia, Brazil. They were photographed and studied at Harvard University and returned to Rio. I have also examined 20 specimens (12 females and 8 males) of *T. froesi* coll. in Januaria, State of Minas Gerais, Brazil (NEW RECORD) by R. Ferreira Da Silva in April, 1972 (Fig. 15).

Allometries of Trichodamon froesi and T. princeps (Figs. 12-14):

The pedipalp of the syntype male of *Trichodamon froesi* is unusually long and fragile-looking. It is probable that the pedipalps of the adult female, although long and thin, do not attain the elongated proportions of the male pedipalps, as shown in Figs. 12 and 13. A larger number of measured adult males and females of *T. froesi* are necessary to corroborate this finding.

If the type material of *T. princeps* consists of fully grown adults, as I suspect it does, then we have a pair of neighbouring species, with a restricted distribution, in which one (*T. froesi*) has developed a strong allometric growth on the male pedipalp length, while *T. princeps* has remained undifferentiated.

The pedipalp spines (Figs. 3, 6-8):

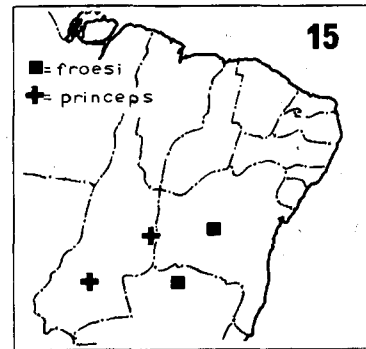
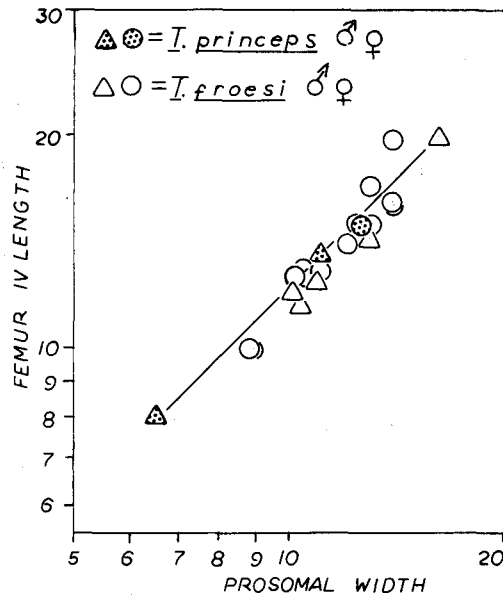
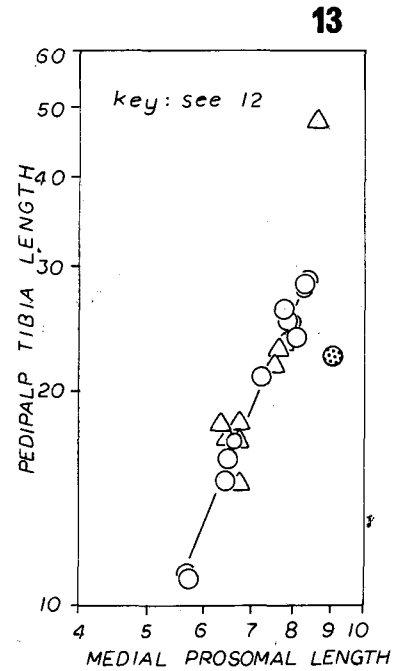
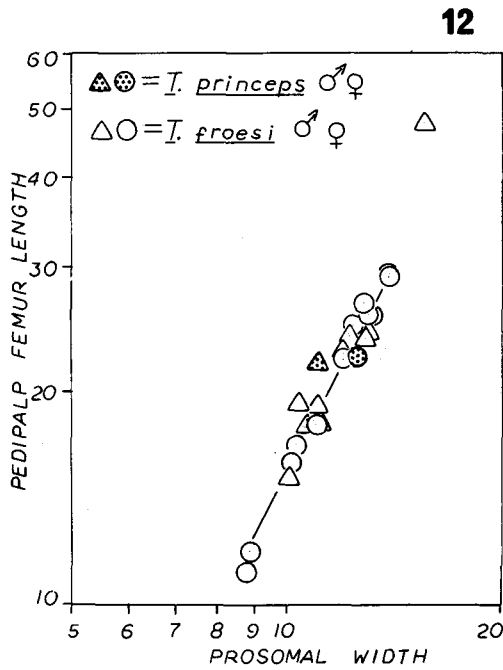
The number of spines on the pedipalp femur appears to be variable, thus this is probably not a reliable character to separate species. The younger *Trichodamon froesi* have dorsally either 5 or 6 spines (Fig. 7) on the pedipalp femur while the adults have 3 or 4 spines. Mello-Leitao indicated there are 6 dorsal spines on the pedipalp femur of *Trichodamon princeps* but this needs verification. On the ventral side of the pedipalp femur the younger *T. froesi* have 4 to 5 spines (Fig. 6) but only 3-4 spines are present in the adults.

Ventrally, the pedipalp tibia of young *T. froesi* has two spines (Fig. 6, A and B) which are reduced to denticles in the adult tibia. The adult retains only a single, well developed distal spine ventrally on the pedipalp tibia. The upper edge is serrated. The dorsal side of the tibia of the adult (Fig. 8) has three long spines, the second and third spines with serrated edges. The pedipalp basitarsus of *T. froesi* has three inconspicuous denticles on the dorsal edge of the cleaning organ, not represented in Fig. 8. The distitarsus is undivided. A single, long basal spine is present on the pedipalp basitarsus (Figs. 6 and 3) while dorsally this segment has in addition to a long curved spine a short, perpendicularly inserted, tubercle.

The trichobothria and tibial segment number of leg four (Fig. 5):

Leg IV has three tibial segments. One male out of 23 *T. froesi* specimens examined presented an asymmetry in which the tibia of the left leg had only two segments (prox. 16.2 mm, 8.2 mm) while the right leg had the normal three segments, with the following ratios of length: 0.53, 0.14, and 0.33 for the distitibia.

The proximal tibia has a distinct trichobothrium hair (pt) on its upper half, varying in position from 0.28 to 0.34. These ratios for the trichobothria were



Figs. 12-15: *Trichodamon princeps* and *T. froesi*. 12 Relationship of pedipalp femur length to prosomal width; 13 Relationship of pedipalp tibia length to medial prosomal length; 14 Relationship of femur IV length to prosomal width; 15 Distribution in eastern Brazil.

calculated by dividing the distance from the trichobothrium to the proximal end of the segment by the total length of the segment. The hair pt was not mentioned by Weygoldt and is here reported for the first time. It has been seen on the proximal tibia of all species of the families Phrynidae, Damonidae and Phrynichidae that have been examined. The basotibial segment has a trichobothrium (bt) positioned between 0.46 to 0.50. The hairs sbc (sub-basal caudal) and stc (sub-terminal caudal) are protracted sc hairs (series caudal) and the mf (meso-frontal) probably belong to the sf hairs (series frontal). In *Damon* C. L. Koch species the hairs sbc, stc and mf are not protracted and cannot be separated from their respective sc and sf hairs.

The number of hairs present in the sf and sc is variable and probably might only serve to characterize populations instead of species. During growth the number of sf and sc hairs becomes reduced.

The rbc (baso-caudal row) has 7 hairs. Rbc is not present in the Phrynidae. In *Damon* species rbc has a lower number of hairs (3-5). *Phrynichus bacillifer* (Gerstaecker) has a reduced and modified rbc, with only two hairs.

External genitalia (Figs. 9-11):

In the male genital organ, the dorsal lobes (dl) are massive and square shaped. Each of the two lateral lobes (ll) presents two parts: a ventral sclerotized projection and a cup with ribs on its walls.

The female genitalia have two sclerotized, claw-like sclerites, the points of which curve and project ventrally backwards and cannot be seen from above. A triangular, lightly sclerotized area separates both sclerites. The sclerites have an elongated depression medially at their bases.

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Note added in proof

The trichobothrium pt has recently been found by Weygoldt (pers. comm.) while looking for the sockets of the trichobothria, most of the hairs usually being broken off in preserved specimens. Weygoldt considers the socket of pt to be a "giant single slit sense organ" and not a trichobothrium.

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