

3. Distitarsus I with three tarsomeres..... **Sarasinicinae**
 . Distitarsus I with two tarsomeres..... **Epedaninae**

Distribution: Epedanidae is endemic to Asia. Dibuninae is one of the dominant components of the opilionofauna of the Philippines. The other three subfamilies are more abundant in Indonesia, Thailand, and Malaysia. They also occur in Myanmar (Burma) and highlands of Nepal. There are a few records from Japan, southern China, and Vietnam.

Relationships: Epedanidae was identified as the sister group of Gonyleptoidea in a cladistic analysis of Grassatores (Kury, 1993a). The loose structure of the glans and follis seems to support this view. Internal relationships of the four subfamilies have not been investigated.

Main references:

- **Systematics:** Roewer (1938), Suzuki (1969), Kury (1993a, 2003).
- **Natural History:** Miyosi (1941).

Escadabiidae Kury and Pérez in Kury, 2003

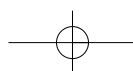
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Etymology: *Escadabius*, from type locality Escada, Pernambuco, Brazil, and Greek *bios* (living).

Characterization:

- Size: Dorsal scutum 2.5–3.5 mm long.
- Dorsum (Figure 4.27a): Dorsal scutum campaniform, with sides straight, hourglass shaped in a few species. Ocularium small, with a few granules and sometimes a median spine. Mesotergum divided into four areas by straight transverse grooves, without relevant armature, area I longer than the others.
- Venter: Sternites may be smooth and unarmed or with huge lateral projections (in *Escadabius* and *Jim*, Figure 4.27c).
- Chelicerae (Figure 4.27a): Weak and not sexually dimorphic. Basichelicerite short, with well-marked bulla.
- Pedipalps (Figures 4.27a,c): More or less as long as dorsal scutum. Without special modifications. Femur with two to three ventral spines, patella with one

Figure 4.26. Epedanidae. (a) *Pasohnus bispinosus* from Malaysia, male, habitus lateral (from Suzuki, 1976c). (b) *Dibunus albitarsus* from Philippines, male, habitus, lateral view, and detail of pedipalpus, mesal view (from Roewer, 1927). (c–n) Left chelicerae, frontal view, sample of diversity in the family (all from Roewer, 1938). (o) *Takaoia* sp. from Malaysia, pedipalpus and chelicerae, lateral. (p) *Takaoia* sp. from Malaysia, distal part of penis, dorsolateral. (q) *Dibunus* sp. from Philippines, distal part of penis, dorsolateral.



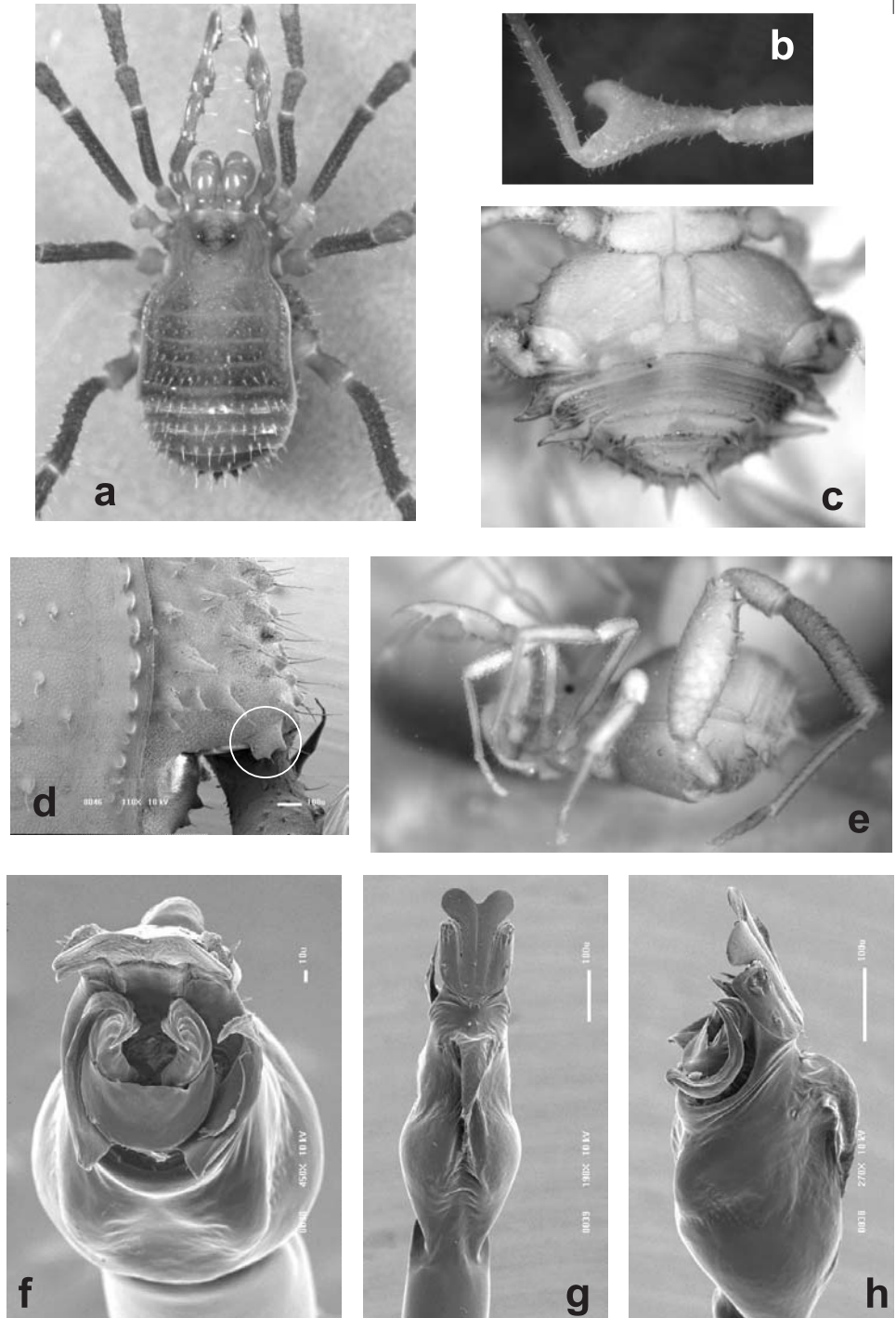
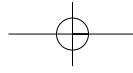
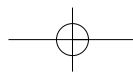
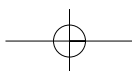


Figure 4.27. Escadabiidae. (a) *Baculigerus* sp. (Ceará), male habitus, dorsal view. (b) *B. littoris* (Bahia), male tibia II, lateral, showing apophysis. (c) *Escadabius ventricalcaratus* (Pernambuco), male coxa IV, stigmatic area and free sternites showing multiple falciform apophyses. (d) *B.* sp. (Ceará), coxa IV showing strong granulation and bifid apophysis (circle). (e) *E. ventricalcaratus* (Pernambuco), male habitus, lateral view. (f–h) *B.* sp. (Ceará), distal part of penis, views dorsoapical, ventral, and lateral, respectively.



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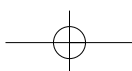


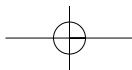
mesal spine. Tibia and tarsus each with a row of a few ventromesal and ventroectal setiferous tubercles.

- **Legs:** All legs short and granulous. Coxa IV of male coarsely granulate, with dorsoapical apophysis made up of two subequal branches (Figure 4.27d). Its lateral border is parallel to the main axis of the body. Femora I–III straight, IV curved subbasally, strongly incrassate in males of *Escadabius* (Figure 4.27e). Tibiae I–II (Figure 4.27b) with differentiated granulous distal area that may develop into a deep notch and/or a huge apophysis.
- **Genitalia:** Penis (Figures 4.27f,g) like that of the other “Samooidea”; it possesses a pair of rigid conductors and a reversible capsula interna. Ventral plate (Figure 4.27g) not defined, as in Gonyleptoidea. Pars distalis well separated from pars basalis by a constriction (absent in the *Escadabius*), with a ventral lamina apical that may be armed with small lateral spines. Pars distalis with a ventral keel-shaped protuberance (Figure 4.27h). Pair of well-developed rigid conductors that do not sink deeply into the glans socket (Figure 4.27f); conductors are vestigial in *Escadabius*. Stylus is very large and apically surrounded by a well-developed hornlike parastylar collar (Figure 4.27f).
- **Color:** Background light to dark brown, with more or less intense yellow mottling; legs may be ringed. The preserved specimens of *Escadabius* are yellowish. Body and appendages are pale yellow in the troglobite species.
- **Sexual dimorphism:** Male and female are remarkably uniform in chelicerae, pedipalps, armature, and legs, except for the tibiae I and II, which only in males bear a bulky distal region, distinguished by different color and granulation, that may develop into a notch and may extend forming a strong process. In a few species (e.g., genus *Escadabius*), the free sternites of males bear greatly developed spiniform apophyses, while those of females are unarmed.

Distribution: Originally the family was restricted to the coastal margin of the Brazilian states of Pernambuco and Bahia, but with all unpublished records (including *Spaeloleptes* **new familial assignment**) the distribution should be expanded to the coast of Ceará and caves in the dry central part of the state of Minas Gerais, where the cavernicolous escadabiids could represent an example of relictual distribution.

Relationships: Some genera were included in the matrix of Laniatores of Kury (1993a), grouped with Kimulidae (Samooidea). A possible sister-group relationship of both families is based on the presence of an incrassate femur IV in males and penial characters: clear division between pars distalis and pars basalis, ventral keel in pars distalis, and the presence of an apparently homologous small parastylar collar. Two species groups can be recognized in Escadabiidae: (1) The *Escadabius* species group is characterized by the dorsal scutum clearly campaniform and strongly convex, femur IV strongly incrassate, and sternites with large lateral falciform projections in males; penis without setae and conductors very small; pars distalis not separated from *pars ventralis* by a groove; lamina apicalis of pars distalis weakly developed. (2) The other group includes the remaining genera. They are characterized





by more variable habitus body shape from hourglass to campaniform, sternites poorly armed or unarmed, and femur IV not enlarged in males, but with tibia I or II (or both) modified in a warty or saddle-shaped mound. The penis has small setae and conductors well developed; pars distalis separated from pars ventralis by a groove; lamina apicalis of pars distalis well developed. *Recifesius pernambucanus* is included in the second group because of the clear division of pars distalis and pars basalis.

Main references:

- **Systematics:** Roewer (1949), Soares (1978, 1979).

Fissiphalliidae Martens, 1988

Ricardo Pinto-da-Rocha

Etymology: *Fissiphallius*, from Latin *fissus* (split) and Greek *phallos* (penis).

Characterization:

- Size: Dorsal scutum 2.0–3.3 mm. Leg IV 3.1–8.6 mm.
- Dorsum: Body trapezoidal, mesotergum higher than prosoma. Ocularium close to anterior border, narrow with two tubercles or one large spine. Four areas on dorsal scutum; I–IV and posterior margin smooth or with small tubercles; I undivided; grooves I–IV “V” shaped (Figure 4.28a) or straight (Figure 4.28b). Free tergites with one long tubercle or small-tuberculate. Anal opercle tuberculate, or with one or three larger tubercles.
- Venter: Genital opercle larger or shorter than spiracular area.
- Legs: Legs straight, short, tuberculate; IV with larger tubercles in some males. Coxa IV anterior (near grooves II–IV), small-tuberculate or with pointed tubercles. Femur and tibia with some larger tubercles apicad, never longer than segment width. Tarsal formula: 3–4(2):5–7(3):5:5. Claws smooth and subparallel. Tarsal process and scopulae absent.
- Chelicerae: Similar in both sexes; bulla well defined, smooth or small-tuberculate.
- Pedipalps: Short, thick, femur with two basal long and one subapical mesal setae, patella with one mesal seta, tibia and tarsus with ectal-mesal setae.
- Genitalia (Figure 4.28c): Truncus with a long rutrum and a dorsal plate called a stragulum opposite each other; both protect the long, straight, and slender stylus. An inflatable vesicle is on the base of the stylus and allows it to overcome the length of the rutrum to reach the feminine pore. Ventral plate with two to three pairs of setae on venter of distal half, circled keel on median region with two to four pairs of setae.
- Color: Varies from yellowish to pale brownish with or without brown stripes or dots on dorsal scutum and free tergites.
- Sexual dimorphism: Males show larger tubercles on trochanter to tibia (mainly on leg IV), free tergites, and anal opercle. Females have body and legs smaller than males. Male of *E. martensi* has a swollen area on venter of tibia II, perhaps a glandular region.

