

## Review of the New World species of *Pharaxonotha* Reitter (Coleoptera: Languriidae)

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**Abstract:** The New World species of *Pharaxonotha* Reitter are reviewed. Four species are recognized: *Pharaxonotha floridana* (Casey) is known only from Florida, breeding in the cones of *Zamia pumila*; *P. kirschii* Reitter is a widespread, stored products pest, often associated with cotton bolls, stored grain, and edible tubers; two new species from Costa Rica, *P. clarkorum* and *P. confusa*, feed on the pollen of *Zamia skinneri* and *Z. fairchildiana* respectively. A key to the species found in the New World is presented.

Beetles and cycads are both ancient groups originating in the Paleozoic. It is not surprising therefore, that the life-cycles of some beetles are closely linked to their cycad hosts and that some of these associations have persisted for a long time (Norstog 1987). Some of these associations, such as boganiid beetles and their cycad hosts in South Africa and western Australia, must date to the Jurassic (Endrödy-Younga and Crowson 1987) while others may be of recent origin. It is beyond the scope of this paper to determine the historical associations between *Pharaxonctha* and cycads. This work was prepared, at the request of John M. Kingsolver (Systematic Entomology Laboratory, United States Department of Agriculture), to make the names of undescribed species available for ecologists studying the pollination of *Zamia* in Costa Rica.

Total body length was measured from the anterior edge of the head to the apex of the elytra. For previously described species, these figures were decreased, increased, or both to correspond to published information. The pronotum was measured along its midline from the anterior to posterior edges and at its widest point. Elytral length was measured from its base adjacent to the scutellum to its apical edge. Measurements were made from

selected specimens, and the ranges and ratios are based upon ten individuals, if available, for each species. Since I did not make an exhaustive search for material, precise locality data for previously described species are omitted. Each specimen used in this study has my identification label attached to its pin. The specimens are deposited in the following collections: my personal collection (JPCC); Snow Entomological Museum, University of Kansas, Lawrence, USA (SEMC); Museo de Insectos, Universidad de Costa Rica, San José (UCRI); National Museum of Natural History, Washington, DC, USA (USNM).

### *Pharaxonotha* Reitter

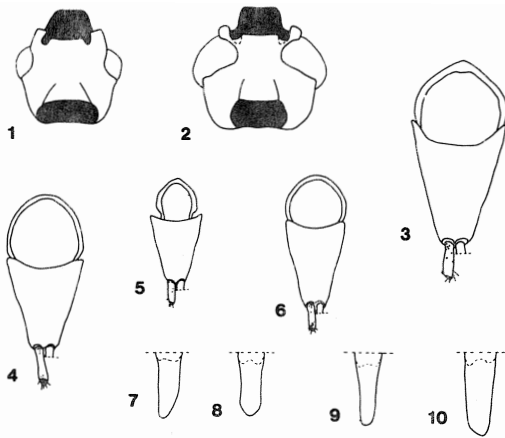
*Pharaxonotha* Reitter, 1875: 44. Type species, by monotypy, *P. kirschii* Reitter.

*Planismus* Casey, 1890: 500. Type species, by monotypy, *P. floridanus* Casey.

Sen Gupta and Crowson (1971) reviewed the taxonomic history of *Pharaxonotha*, originally described as a cryptophagid but frequently placed in Erotylidae or Languriidae by subsequent authors. Crowson (1955) established the languriid subfamily Pharaxono-

thinae which was subsequently reduced to tribal status (San Gupta and Crowson 1967, 1971). This name, however, does not have priority, so Xenoscelini, as listed in a recent catalog of the Languriidae of North America (Lawrence and Vaurie 1983), is the correct tribal name.

Members of this genus have the characters of Languriidae: Xenoscelinae (Loberinae auct.): Xenoscelini (Pharaxonothisini auct.): *Pharaxonotha* (Sen Gupta and Crowson 1971). Including the new species described below, there are about seven species described worldwide, with apparently undescribed species from South Africa (Sen Gupta and Crowson 1971).



Figs. 1-10. *Pharaxonotha* spp. (1 and 2) head, ventral. (1) *P. kirschii*; (2) *P. clarkorum*. (3-6) male genitalia, tegmen, ventral. (3) *P. kirschii*; (4) *P. floridana*; (5) *P. clarkorum*; (6) *P. confusa*; (7-10) male genitalia, apex of median lobe, ventral. (7) *P. floridana*; (8) *P. clarkorum*; (9) *P. confusa*; (10) *P. kirschii*. Fig. 1 modified from Sen Gupta and Crowson (1969).

Key to the New World species of *Pharaxonotha*

1. Length 4.0–4.5 mm.; eyes small, not prominent ventrally (Fig. 1), ratio of head width/dorsal interocular distance to head width/ventral interocular distance 1.1; cuticle between punctures on frons and pronotum smooth, shiny; not associated with *Zamia* . . . . . *kirschii* Reitter

— Length 2.1–3.8 mm.; eyes large, prominent ventrally (Fig. 2), ratio of head width/dorsal interocular distance to head width/ventral interocular distance 1.4–

1.5; cuticle between punctures on frons and pronotum granulate, dull; associated with *Zamia*. . . . . 2

2. Pronotal length/width 0.69–0.74; head width/dorsal interocular distance 1.57–1.66; head width/ventral interocular distance 2.09–2.38; known distribution Florida . . . . . *floridana* (Casey)

— Pronotal length/width 0.74–0.80; head width/dorsal interocular distance 1.70–1.96; head width/ventral interocular distance 2.50–3.06; known distribution Costa Rica . . . . . 3

3. Length 2.1–2.4 mm.; elytral length/pronotal length 2.70–2.78; head width/dorsal interocular distance 1.70–1.83; head width/ventral interocular distance 2.50–2.61; apex of ventral edge of median lobe symmetrical (Fig. 8); scutellary stria with 7–9 punctures; punctures on elytral disc in intervals between striae extremely fine, barely visible at 25 x magnification, their diameters less than 1/4 diameter of strial punctures; known host plant *Zamia skinneri* . . . . . *clarkorum* sp. nov.

— Length 2.8–3.6 mm.; elytral length/pronotal length 2.89–3.15; head width/dorsal interocular distance 1.90–1.96; head width/ventral interocular distance 2.70–3.06; apex of ventral edge of median lobe asymmetrical (Fig. 9); scutellary stria with 9–11 punctures; punctures on elytral disc in intervals between striae coarse, distinctly visible at 25 x magnification, their diameters more than 1/2 diameter of strial punctures; known host plant *Zamia fairchildiana*. . . . . *confusa* sp. nov.

*Pharaxonotha clarkorum*, sp. nov.  
(Figs. 2,5,8)

Types. Holotype: COSTA RICA, Heredia, Prov., Puerto Viejo de Sarapiquí, Finca La Selva, 19 November 1982, in cone of *Zamia skinneri*, David B. Clark coll. 1 (USNM), Paratypes: same data as holotype (4 JPCC, 2 SEMC, 3 UCRI, 8 USNM); same data as holotype except 17 October 1985 (4 JPCC, 2 SEMC, 3 UCRI, 8 USNM).

**Etymology.** This species is named for Deborah and David Clark, co-directors of La Selva Biological Station.

**Description.** Length 2.10–2.40 mm. Body elongate, about 2.60–2.76x longer than wide, widest at posterior third. Head, pronotum, elytra reddish brown; metasternum, ventrites reddish brown. Head 1.70–1.83x wider than dorsal interocular distance, 2.50–2.61x wider than ventral interocular distance. Labrum impunctate. Clypeus punctate. Frons reticulate, punctate, punctures coarser, denser than on clypeus. Pronotum 0.74–0.80x longer than wide, granulate, punctate, punctures on disc similar in size and density to those of frons, punctures on margins finer. Elytra 2.70–2.78x longer than pronotum, scutellary striole with 7–9 punctures, intervals finely punctate, punctures barely visible at 25x magnification. Metasternum granulate, punctate, punctures finer, denser than on prosternum. Aedeagus (Figs, 5, 8) with apex of median lobe symmetrical.

**Habitat.** Taken in Costa Rica from male cones of *Zamia skinneri*.

*Pharaxonotha confusa*, sp. nov.  
(Figs. 6, 9)

**Types.** Holotype: COSTA RICA. Puntarenas Prov., San Vito de Coto Brus, Las Cruces, Wilson Botanical Garden, 25 March 1985, from male cones of *Zamia fairchildiana*, G. E. Schatz coll. (USNM). Paratypes: same data as holotype (1 JPCC, 3 UCRI, 3 USNM).

**Etymology.** The name *confusa* is from the Latin meaning confused, referring to the apparently irregular elytral punctation.

**Description.** Length 2.80–3.60 mm. Body elongate, about 2.76–2.89x longer than wide, widest at middle. Head, pronotum light reddish brown to reddish brown, elytra lighter: metasternum, ventrites reddish brown. Head 1.90–1.96x wider than dorsal interocular distance, 2.70–3.06x wider than ventral interocular distance, labrum punctate. Clypeus punctate, punctures coarser, denser than on labrum. Frons similar to clypeus. Pronotum 0.74–0.76x longer than wide, punctate, punctures on disc similar in size and density

to those on frons, punctures on margins denser. Elytra 2.84–3.15x longer than pronotum, scutellary striole with 9–11 punctures, intervals coarsely punctate, punctures distinctly visible at 25x magnification. Metasternum punctate, punctures visible at 25x magnification. Metasternum punctate, punctures sparser than on prosternum. Aedeagus (Fig. 6,9) with apex of median lobe asymmetrical.

**Habitat.** Taken in Costa Rica from male cones of *Zamia fairchildiana*.

*Pharaxonotha floridana* (Casey)  
(Figs. 4, 7)

*Planismus floridanus* Casey, 1890: 500. Type locality: Biscayne Bay, Florida.

*Pharaxonotha zamiae* Blake, 1928: 111. Type locality: Homestead, Florida.

**Description.** Length 2.60–3.80 mm. Body elongate, about 2.53–2.58x longer than wide, widest at middle. Head, pronotum elytra light reddish brown: metasternum, ventrites darker. Head 1.57–1.66 wider than dorsal interocular distance, 2.09–2.38x wider than ventral interocular distance. Labrum impunctate. Clypeus punctate. Frons punctate, punctures coarser, slightly sparser than on clypeus. Pronotum 0.69–0.74x longer than wide, punctate, punctures on disc sparser than those on frons, punctures on margins finer, denser. Elytra 2.86–3.05x longer than pronotum, scutellary striole with 9–11 punctures, intervals finely punctate, punctures visible at 25 x magnification. Metasternum punctate, medial punctures denser than on prosternum, lateral punctures coarser, denser. Aedeagus (Figs, 4, 7) with apex of median lobe asymmetrical.

**Material Examined.** Eighteen specimens from Florida.

**Habitat.** Blake (1928) reported this species from *Zamia floridana*. That name for this cycad, however, is a junior synonym of *Z. angustifolia*, known only from Cuba, so it appears that the true host is the native *Z. pumila* (Ralph E. Brooks, pers. comm.).

**Comments.** The larva was described and illustrated by Rymer Roberts (1939).

*Pharaxonotha kirschii* Reitter  
(Figs. 1, 3, 10)

*Pharaxonotha kirschii* Reitter, 1875: 44. Type locality: Mexico.

*Thalisella conradti* Gorham, 1898: 249. Type locality: Vera Paz, Guatemala.

**Description.** Length 4.00–4.50 mm. Body elongate, about 2.41–2.82x longer than wide, widest at posterior third. Head, pronotum, elytra reddish brown to dark reddish brown; metasternum, ventrites slightly darker. Head 1.39–1.52 x wider than dorsal interocular distance, 1.58–1.68 wider than ventral interocular distance. Labrum punctate. Clypeus punctate, punctures coarser, denser than on labrum. Frons punctate, punctures finer, sparser than on clypeus. Pronotum 0.73–0.80x longer than wide, punctate, punctures on disc similar in size and density to those of frons, punctures on margin finer. Elytra 2.65–2.85x longer than pronotum, scutellary striole with 7–9 punctures, intervals finely punctate, punctures barely visible at 25x magnification. Metasternum punctate, medial punctures finer, sparser than on prosternum, lateral punctures similar in size and density. Aedeagus (Figs, 3, 10) with apex of median lobe asymmetrical.

**Material Examined.** Thirty-four specimens from the southern United States (Texas), Mexico (Chiapas, Oaxaca, San Luis Potosi, Tamaulipas), Guatemala, Costa Rica (near San José), and Portugal.

**Habitat.** This widespread, stored products pest is known from North America, South America, and Europe. It has been reported from cotton bolls, corn meal, edible tubers, stored maize, wheat, and beans (Hinton 1944).

**Comments.** Lawrence and Vaurie (1983) reported the type locality of this species as Troppau, Silesia (presently Opava, Czechoslovakia). Article 72h (ICZN 1985: 147) states that for any animal "captured or collected after being transported by boat, vehicle, aircraft, or mechanical means, the type locality is the place from which the name-bearing type, or its wild progenitor, began its unnatural journey". Since the type was received in a shipment from Mexico, the type locality is Mexico.

Hinton (1945) included descriptions of the egg, larva, pupa, and adult, and he summarized briefly the biology of this species. The larva was illustrated by Böving and Craighead (1931).

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#### RESUMEN

Se revisan las especies del Nuevo Mundo de *Pharaxonotha* Reitter. Se reconocen cuatro especies: '*Pharaxonotha floridana* (Casey), conocida solamente de Florida, se desarrolla en conos de *Zamia pumila*; *P. kirschii* Reitter, difundida plaga de productos almacenados, se encuentra frecuentemente asociada con capullos de algodón, granos y tubérculos; dos nuevas especies de Costa Rica, *P. clarkorum* y *P. confusa*, se alimentan de polen de *Zamia skinneri* y *Z. fairchildiana* respectivamente. Se presenta una clave para la determinación de las especies del Nuevo Mundo.

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