Genus	Vol. 6 (3-4): 429-439	Wrocław, 15 XII 1995

Two new species of *Physonota* BOH. from Mexico, and notes on *Ph. cerea* BOH.* (*Coleoptera*: *Chrysomelidae*: *Cassidinae*)

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ABSTRACT. *Physonota convexa* n. sp. and *Ph. puncticollis* n. sp., both from Mexico, are described. *Ph. cerea* BOHEMAN, 1854 is a good species, not synonym of *Ph. citrina* BOHEMAN, 1854.

Key words: entomology, taxonomy, *Coleoptera*, *Chrysomelidae*, *Cassidinae*, new species, Neotropics.

The genus *Physonota* BOHEMAN, 1854 was proposed for several Neotropical and Nearctic *Cassidinae* species of medium size, oblique clypeus and simple tarsal claws. SPAETH (1913) divided the genus *Physonota* into three genera, and in his catalogue of world species (SPAETH, 1914) he listed in the genus *Physonota* sensu novo 33 species distributed mostly in Central America, with the centre of distribution in Mexico (21 species). After the date of publication of the catalogue only four species were described, but five were synonymized or transferred to another genus. Recently, 33 species have been included in the genus *Physonota*, but taxonomic status of three of them is unclear. The genus has never been revised, but most species were figured in colour by CHAMPION (1894) in his monumental and excellent work in the series "Biologia Centrali-Americana".

In the material sent to me by E. G. RILEY (Texas A&M University, USA) and R. BROOKS (Snow Entomological Museum, Lawrence, USA) I found specimens of two new species. Their description is given below.

*Papers Celebrating the 90th Birthday of Dr. Bolesław Burakowski

Physonota convexa n. sp.

ETYMOLOGY

Named after strongly convex body.

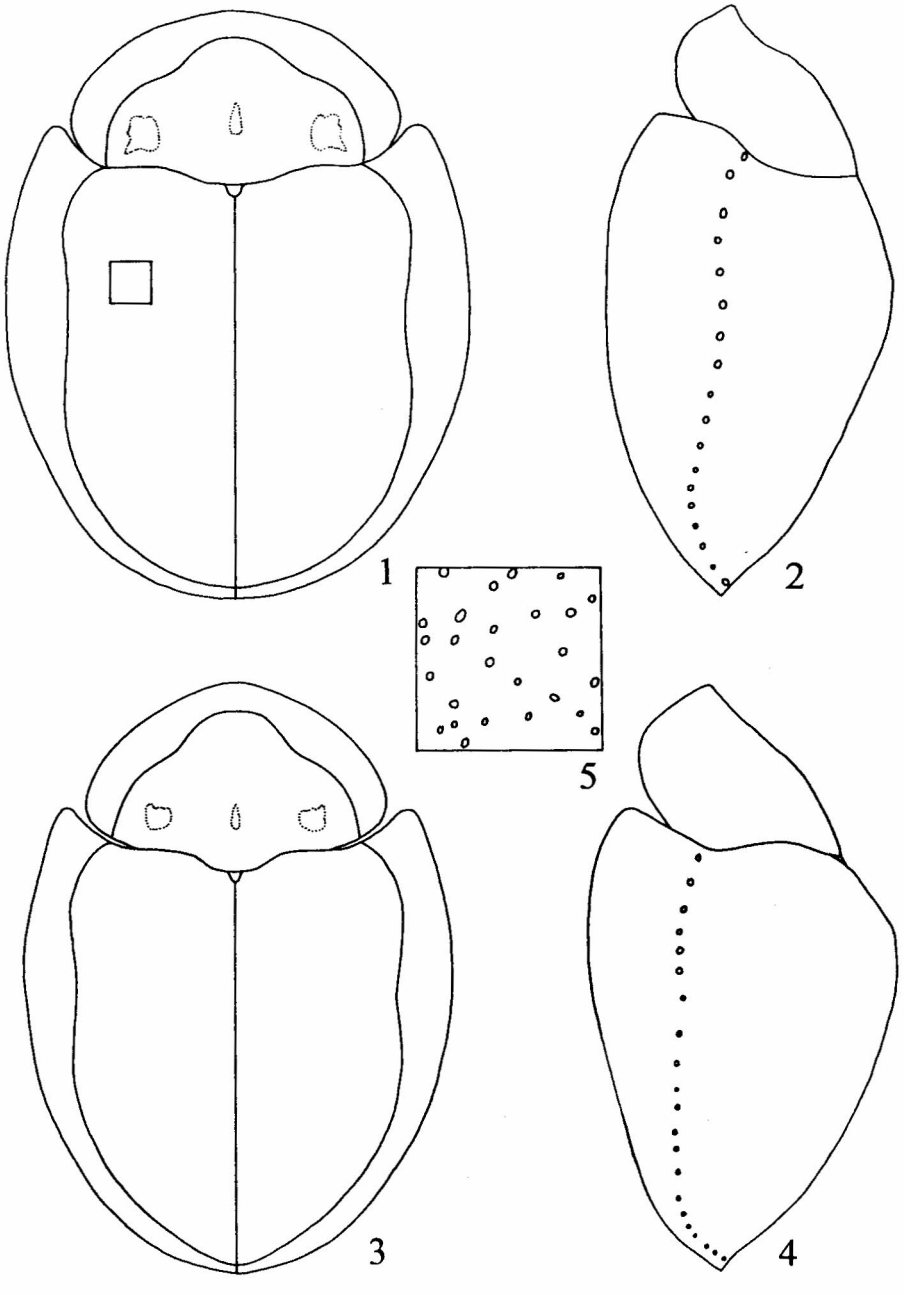
DIAGNOSIS

It belongs to *Ph. alutacea* group which comprises also *Ph. alutacea* BOH., *Ph. lutarella* BOH. and *Ph. pacifica* SP. All species of the group have strongly convex body, large elytral puncturation and maculate pronotal disc. *Ph. pacifica* differs in smaller, more elongate body, elytra less convex and at least explanate margin of elytra with black spots (*Ph. convexa* is larger, almost hemispherical, strongly convex, with elytra immaculate). *Ph. lutarella* differs in larger body, elytra more convex, gibbous, margin of elytra behind humeral angle straight or slightly concave (in *Ph. convexa* the margin is regularly convex). *Ph. lutarella* is a more southern species, distributed in north-eastern part of South America (Venezuela, Colombia). *Ph. alutacea* is most similar but differs in more elongate body, coarser elytral puncturation, elytra usually with black spots (at least at top of elytral convexity). Specimens of *Ph. alutacea* with elytra immaculate (thus coloured specimens are common in Nicaragua and Panama) are very similar to *Ph. convexa* but differ in slightly more elongate body and elytral convexity almost gibbous (in *Ph. convexa* elytral disc is strongly but regularly convex). Both species differ also in the structure of spermatheca and sclerite of internal sac of median lobe (for *Ph. alutacea* see figs. in SANDERSON, 1948). *Physonota alutacea* is the most widespread species, distributed from S USA to Colombia, while all specimens of *Ph. convexa* were collected in S Mexico (Jalisco, Oaxaca and Chiapas Provinces).

DESCRIPTION

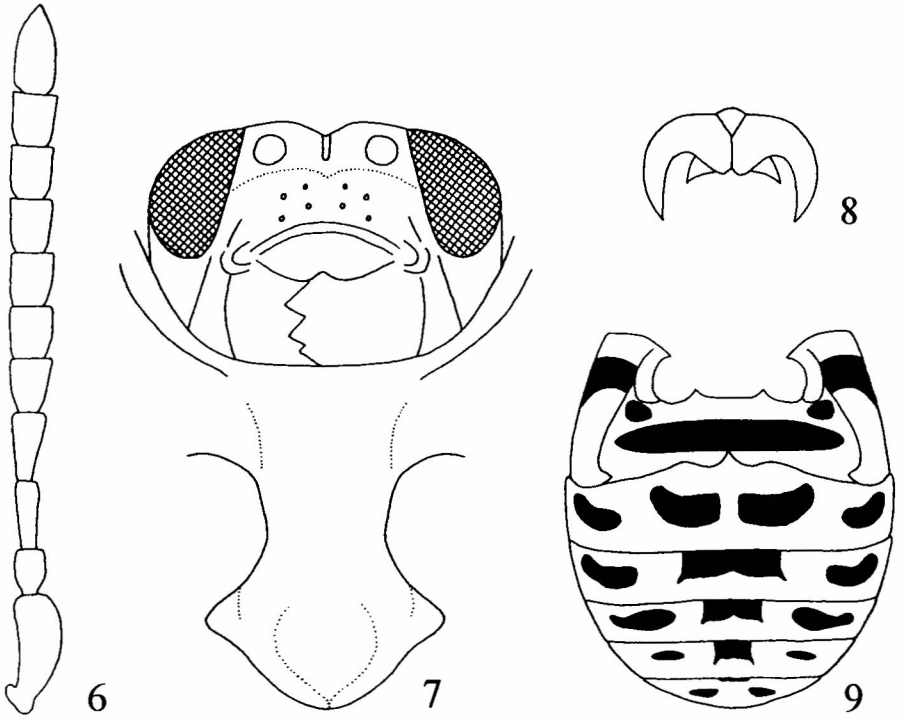
Length: males 10.5-11.8, females 10.9-13.0 mm; width: males 8.4-9.2 mm, females 7.8-9.5 mm, length of pronotum: 3.5-4.3 mm, width of pronotum: 5.8-6.7 mm; length/width ratio: males 1.23-1.28, females 1.37-1.47. Body stout, almost hemisphaerical (figs 1, 3).

Pronotum yellow, disc with three brown to black spots - the median varies from thin line to broad oval, lateral square to round, usually with irregular border, often the lateral spot is composed of connected brown and black small spots. In some specimens brown spots and shadows form on the disc a large M-shaped figure of indistinct borders. Scutellum and elytra yellow, without spots, only in few specimens punctures of marginal and submarginal elytral rows with darker centre. Clypeus yellow. Labrum yellow to brownish, only margin darker brown. Pro- and mesosternum yellow, hind margin of prosternal plates and anterior margin of mesosternal plates sometimes brown to black. Basal half of metasternum with large, transverse black band, the band in some specimens in lateral parts widened anterad and connected with metacoxal cavities. Lateral metasternal plates yellow or near to anterior margin with black spot. First sternite with two square to rectangular spots in the middle



1-5. *Physonota convexa* n. sp.: 1, 2 - male; 3, 4 - female; 1, 3 - dorsal view, 2, 4 - lateral view, 5 - puncturation of elytra

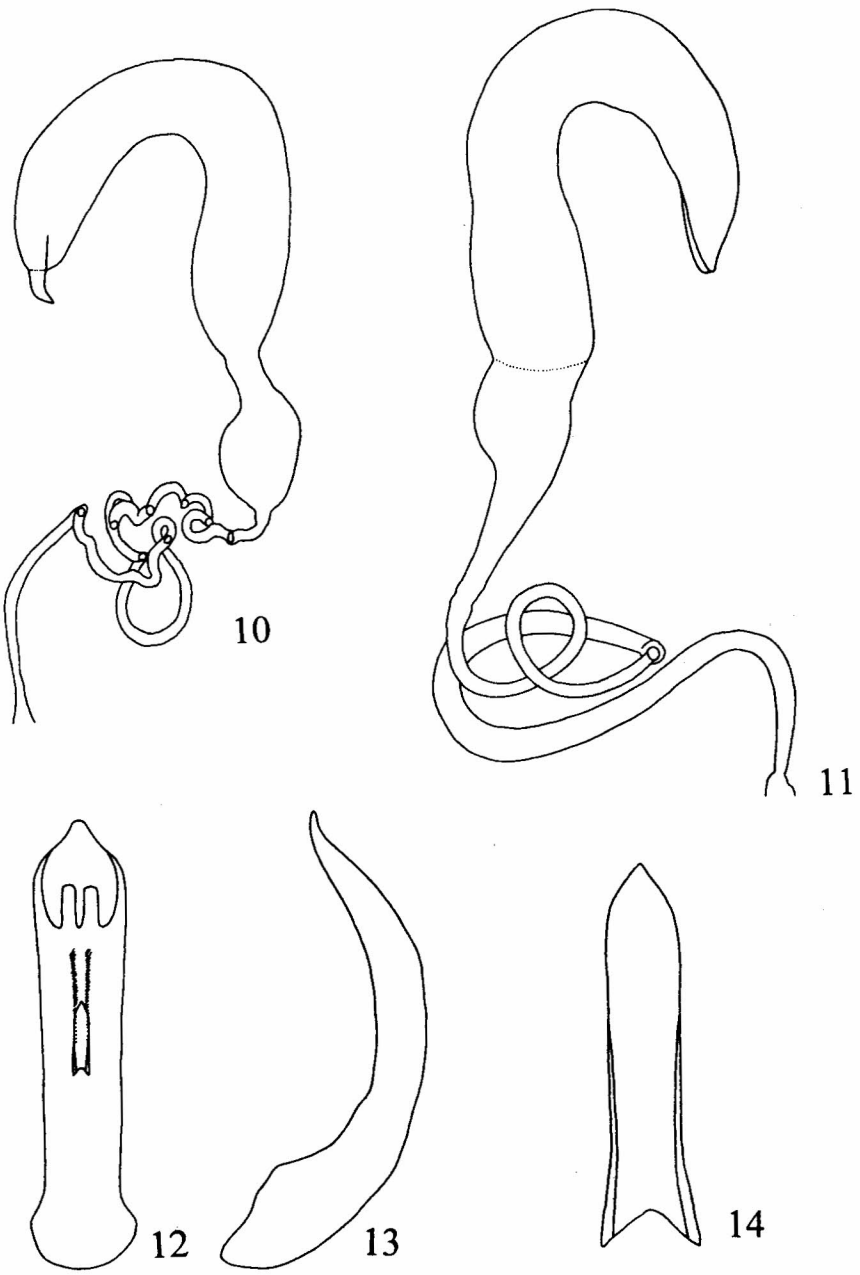
(broadly divided by yellow) and transverse spot on each side. Sternites II-V with rectangular spot in the middle and transverse to oblique spot on each side. The median spot often with emarginate posterior margin and extended corners, the lateral spots reaching or not the anterior margin of sternite. The median spot of the last sternite often reduced to dark line on anterior margin of the sternite (fig. 9). Antennae wholly yellow, or last 4-5 segments slightly darker testaceous to brown. Legs mostly yellow, exterior half of dorsal side of femora with brown to black, elongate spot, the spot in some specimens forms an incomplete ring at 2/3 femur length. Anterior margin of tibiae in basal half with elongate brown to black spot.



6-9. *Physonota convexa* n. sp.: 6 antenna, 7 - head and prosternum, 8 - tarsal claws, 9 - maculation of abdomen and metasternum

Pronotum ellyptical, width/length ratio 1.5-1.7, with maximum width slightly anterad to the middle, sides broadly rounded. Disc moderately convex, surface smooth, shiny, usually with fine median furrow. Explanate margin broad, moderately declivous, surface smooth, shiny, with honeycomb structure.

Scutellum small, subpentagonal. Base of elytra distinctly wider than pronotum, humeral angles rounded. Disc strongly, regularly convex, with top of convexity in 1/4 length (figs 2, 4). Surface of disc with no longitudinal elevation, puncturation coarse, irregular, only along suture punctures have tendency to form a row. Punc-



10, 12-14. *Physonota convexa* n. sp.; 11 - *Ph. alutacea* Boh.; 10, 11 - spermatheca; 12, 13 - male genitalia: 12 - dorsal view, 13 - lateral view; 14 - sclerite of internal sac

tures distributed almost uniformly on whole surface, distance between punctures 1.1-3.0 times wider than puncture diameter (fig. 5). Marginal row distinct, with punctures c. thrice larger than in disc. Marginal interval distinct on whole length. Surface beetwen punctures on disc finely microreticulate, shiny. Explanate margin strongly declivous, in the widest part about half width of disc of each elytron, punctate. Punctures as large as those of disc but sparse. Apex of elytral epipleura in male bare, in female sparsely pubescent.

Clypeus very broad, c. four times wider than long, with distinct impressed median line. Clypeal grooves very short but deep, extending to 1/4 clypeal length. Eyes small, gena very short. Labrum broad, emarginate to 1/5 length (fig. 7). Antennae stout, short, length ratio of antennal segments: 100:50:70:70:55:55: 55:55:55:50:90 (fig. 6).

Prosternal collar distinct, especially on sides of head cavity distinctly inverted laterally. Prosternal process broad, shallowly impressed medially, strongly expanded apically, apex rhomboidal with shallow, round or oval impression in the middle (fig. 7).

Legs stout, apex of tibiae not dilated. Last segment of tarsi distinctly longer than the third, reaching slightly beyond marginal setae. Claws stout, simple (fig. 8).

Male genitalia as in figs 12, 13. Sclerite of internal sac simple (fig. 14).

Spermatheca similar to that of *Ph. alutacea*, ductus widened at base but does not form a distinct ampulla (in *Ph. alutacea* ductus forms at base a large ampulla, fig. 10). Glomerous part of ductus less complicated than in *Ph. alutacea*, diameter of duct proportionally larger (fig. 11).

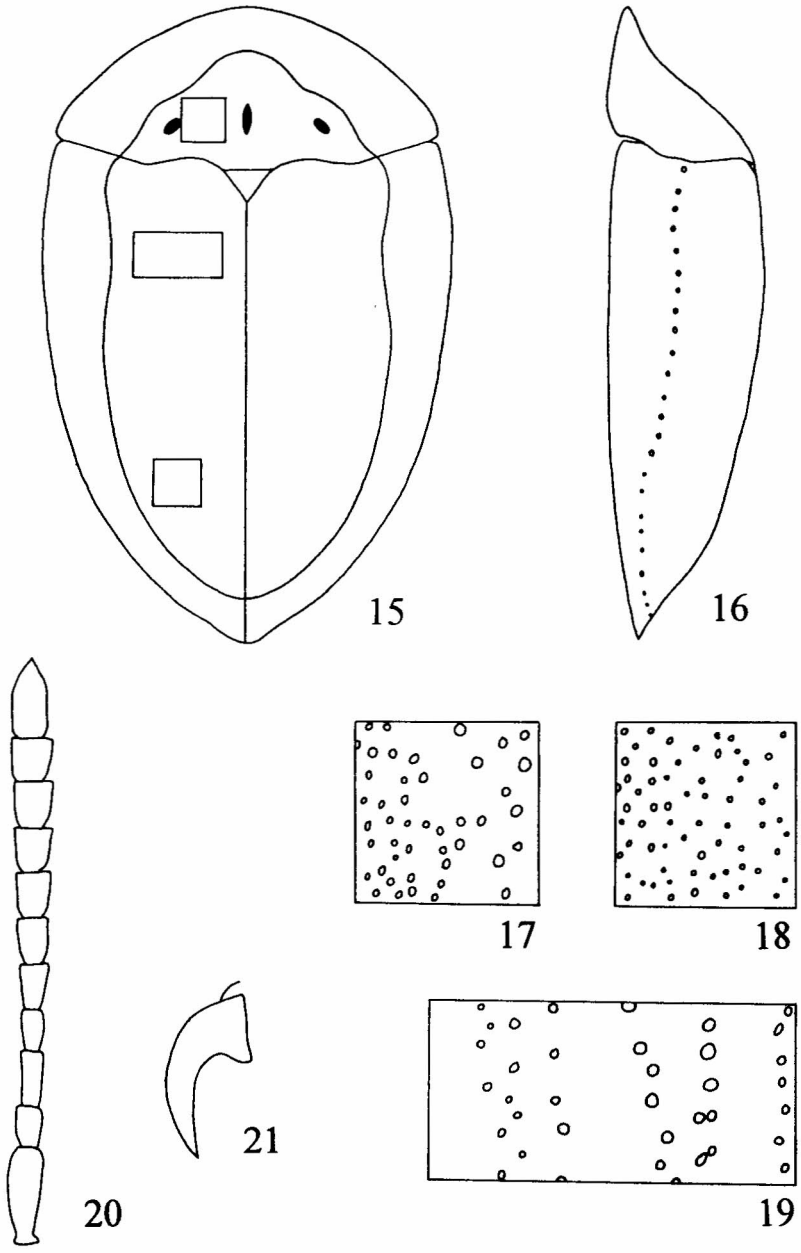
TYPES

Holotype (male) "MEX: Chis. 33 mi. W. Tuxtla Gutierrez, 26-V-83: C. W. &. L. O'BRIEN & MARSHALL"; four paratypes "MEX: Jal., Chamela Biol. Exp. Sta. UNAM, VIII-9-82: C. W. & L. O'BRIEN & WIBMER"; four paratypes "MEX: Jal., Chamela Biol. Exp. Sta. UNAM, 200', VIII-10-82: C. & L. O'BRIEN & WIBMER"; one paratype "MEXICO Jalisco, Chamela bio. Stn. 11 July 1989" " A. Roig Alsina, C. MICHNER, R. BROOKS ex., malaise trap #018"; two paratypes "MEXICO Oaxaca, 5 mi. N. La Ventosa, 4 July 1970, R. E. BEER & PARTY"; one paratype "MEXICO Oaxaca, 5 mi. N. La Ventosa, 6 July 1970, R. E. BEER & PARTY"; one paratype "MEXICO - Oaxaca, 16 mi. N. of Juchitán, 5 July 1955, R. E. BEER & party". Holotype and five paratypes in coll. E. G. RILEY, Texas A&M University, Texas, USA; four paratypes in Snow Entomological Museum, Lawrence, Kansas, USA; one paratype in Manchester Museum, University of Manchester, England; three paratypes in author's collection.

Physonota puncticollis n. sp.

ETYMOLOGY

Named after strongly punctured pronotal disc.



15-21. *Physonota puncticollis* n. sp.: 15 - dorsal view, 16 - lateral view, 17 - puncturation of posterolateral part of disc, 18 - puncturation of disc, 19 - puncturation of anterior part of disc, 20 - antenna, 21 - tarsal claw

DIAGNOSIS

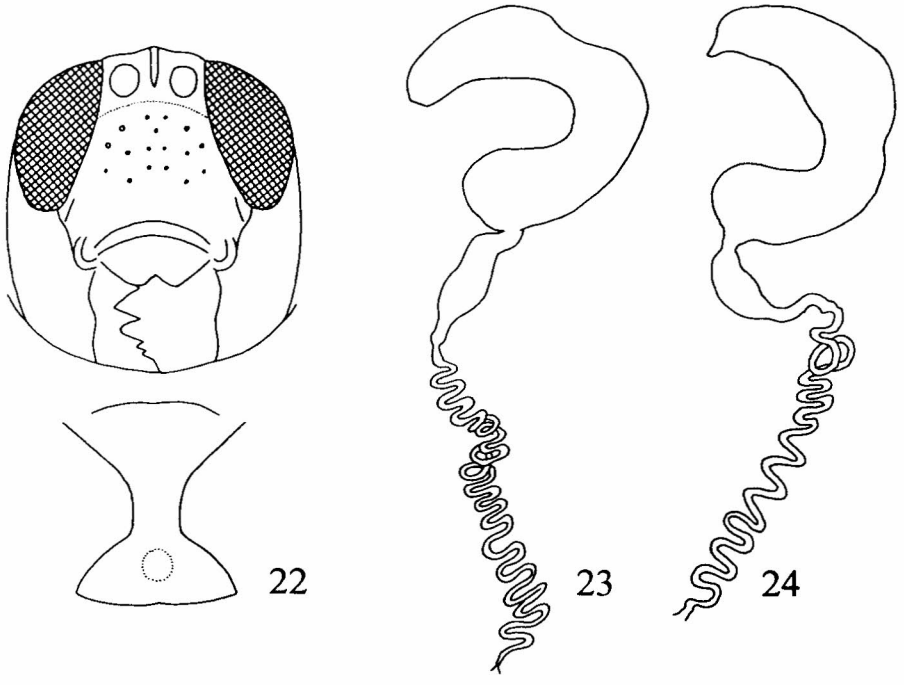
It is a unique species, the only member of the genus with strongly punctured pronotal disc. Depressed body and subacuminate elytral apex place *Ph. puncticollis* near *Ph. attenuata* BOH., *Ph. limoniata* BOH., *Ph. caudata* BOH. but body colouration is rather similar to that of *Ph. mexicana* BOH., *Ph. humilis* BOH. *Ph. flaveola* BOH. and *Ph. separata* BOH. The first three species are distinctly larger (length above 12 mm, in *puncticollis* below 11.5 mm), *Ph. limoniata* differs also in finely punctate elytral disc and explanate margin, and impunctate explanate margin of pronotum, *Ph. caudata* differs in more acuminate elytral apex, impunctate explanate margin of pronotum and sparsely punctate explanate margin of elytra. *Ph. attenuata* like *Ph. puncticollis* has elytral disc with two longitudinal elevations and strong puncturation between elevations but unlike *Ph. puncticollis* impunctate explanate margin of pronotum and elytra. Four species of the *mexicana* group listed above at first glance differ from *Ph. puncticollis* in impunctate pronotal disc (only in some specimens of *Ph. mexicana* on sides of disc there are several punctures) and less acuminate elytral apex. *Ph. flaveola* differs also in finely punctate elytral disc and extremely finely punctate explanate margin; *Ph. humilis* differs in less depressed body, finer and sparse elytral puncturation, impunctate explanate margin of pronotum and pronotal disc with only simple dark spot forming a thin median line, sometimes completely reduced. *Ph. separata* differs in sparsely punctured elytra, impunctate explanate margin of elytra, body stouter with more rounded elytral sides. *Ph. mexicana* at first glance is the most similar to *Ph. puncticollis* but differs in less acuminate elytral apex, mostly impunctate pronotal disc, less prominent elytral longitudinal elevations, sparse puncturation of disc, especially in posterolateral part puncturation never appears rugose (in *Ph. puncticollis* puncturation in posterolateral part of disc is extremely dense, appears rugose).

DESCRIPTION

Length (females): 10.7-11.0 mm, width: 6.7-7.0 mm, length of pronotum: 3.4-3.5 mm, width of pronotum: 6.3-6.5 mm, length/width ratio: 1.53-1.60. Body strongly depressed, elytral apex subacuminate (fig. 15).

Pronotum yellow, disc with three brown to black spots - a thin, short median line, and small, round spot on each side. Upper side of head black, visible through transparent explanate margin of pronotum. Scutellum and elytra yellow. Elytral epipleura with black, narrow, triangular humeral spot and broad sutural spot. Clypeus yellow, except black border close to labrum. Labrum black. Ventral side of pronotum, close to procoxal cavity with round, black spot, in one of the examined specimens the spot is extended posterad up to hind margin of pronotum. Mesosternum yellow. Metasternum mostly yellow, ventral plate in the middle, at base, with square black spot, extreme margins of lateral plates black. Abdominal sternites mostly yellow, only sternites I-IV on each side with small, narrow, transverse, brown spot. Antennal segments 1-4 yellow, segment 5 infuscate dorsally, yellow ventrally, segments 6-11 black.

Pronotum transverse, width/length ratio 1.8-1.9, with maximum width distinctly behind the middle, sides angulate. Disc moderately convex, on whole surface strongly densely punctate, space between punctures 2.2-2.3 times wider than puncture diameter (fig. 18). Explanate margin broad, subhorizontal, at sides shallowly impressed. Whole surface strongly punctured, in anterior part of explanate margin punctures as dense and large as on disc, on sides dense, some punctures touching each other and surface appears slightly irregular; honeycomb structure hardly visible.



22-24. *Physonota puncticollis* n. sp.: 22 - head and prosternum; 23, 24 - variation of spermatheca

Scutellum large, triangular. Base of elytra slightly narrower than pronotum, humeral angles almost straight (fig. 15). Disc depressed, almost straight in profile (fig. 16). Intervals 3 and 5 slightly elevated, form longitudinal, obtuse costae. Punctures moderately large, between suture and interval 5 have tendency to form three regular rows, but additional punctures on intervals disturb the regularity, especially in slope. Distance between punctures in rows 0.5-2.0 times wider than puncture diameter (fig. 19). Between 5th interval and marginal row puncturation completely irregular, in posthumeral part punctures sparse, distance between them 2-3 times larger than punctures, in posterior 2/3 length of side of disc punctures extremely dense, almost touching each other, surface appears rugose (fig. 17).

Intervals, both flat and elevated, three to four times wider than rows. Marginal row with punctures as large as in disc and explanate margin. Marginal interval very narrow, disappears within dense puncturation of disc and explanate margin. Surface beetwen punctures on disc finely microreticulate, shiny. Explanate margin moderately declivous, in the widest part c. 0.7 times as wide as width of each disc of elytron. Surface strongly, densely punctate, space between punctures 0.6-2.0 times larger than puncture diameter, honeycomb structure disappears within puncturation. Apex of elytral epipleura in examined specimens (females) bare.

Clypeus only slightly wider than long, surface without impressed median line, flat, with several moderately large punctures. Clypeal grooves very short extending to 1/6 clypeus length. Eyes small, gena distinct. Labrum moderately broad, emarginate to 1/4 length (fig. 22). Antennae stout, extending to angles of pronotum, length ratio of antennal segments: 100:45:60:45:50:50:50:50:50:45:85 (fig. 20).

Prosternal collar narrow. Prosternal process between procoxae narrow, strongly expanded apically, apex with only slightly arcuate posterior margin, flat, or with indistinct round impression in the middle (fig. 22).

Legs stout, apex of tibiae not dilated. Last segment of tarsi distinctly longer than the third, reaching slightly beyond marginal setae. Claws stout, simple (fig. 21).

Male unknown.

Spermatheca constricted in the middle, basal part of ductus with a narrow ampulla, beyond ampulla ductus forms a long spiral (figs 23, 24).

TYPES

Holotype (female) and two paratypes "4 mi. W Oaxaca" "Oax. Mex., 1 - 19 - 1954, A.A. ALCORN". Holotype and paratype in Snow Entomological Museum, Lawrence, Kansas, USA, one paratype in author's collection.

Physonota cerea BOHEMAN, 1854 bona species

Physonota cerea BOHEMAN, 1854: 232, 1856: 103, 1862: 254; CHAMPION, 1894: 167; SPAETH, 1914: 62 (as syn. of *Ph. citrina* Boh.).

BOHEMAN (1854) described *Ph. cerea*, based on a single specimen collected in "Mexico ad Oaxaca". CHAMPION (1894) examined six more specimens from "Peras in Oaxaca". SPAETH (1914), after examination of the type specimen, synonymized *Ph. cerea* with *Ph. citrina* BOH., without comments, but the holotype preserved in Zoologisches Museum, Humboldt Universität has a label with curator's handwritting "an monstros *Phys. nitidicollis*?". *Physonota nitidicollis* BOH. is closely related to *Ph. citrina* and the label note probably prompted SPAETH to synonymize *Ph. cerea* with *Ph. citrina*, the latter species being more similar to *Ph. cerea* than to *Ph. nitidiciollis*.

I have examined the holotype of *Ph. cerea*, the specimens from Peras recorded by CHAMPION, and six more specimens conspecific with the holotype, all from

Oaxaca Prov. in Mexico, and in my opinion *Ph. cerea* is a distinct species, related to *Ph. citrina*, *Ph. nitidicollis* and *Ph. sublaevigata* SPAETH. All these species are characterized by strongly convex elytral disc, gibbous to angulate in profile. *Ph. cerea* distinctly differs from its relatives in pronotal disc with irregular, transverse and oblique rugosities. This character is constant in all the examined specimens and does not represent a theratology, as was suggested by handwritting on the holotype label.

ACKNOWLEDGEMENTS

I would like to express my sincere thanks to B. J. ALDRIDGE (British Museum, Natural History, England), Dr. R. BROOKS (Snow Entomological Museum, Lawrence, USA), Dr. F. HIEKE (Zoologisches Museum, Humboldt Universität, Germany), and E. G. RILEY (Texas A&M University, Texas, USA) for the loan of the specimens.

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