

**DESCRIPTIONS OF NEW OR POORLY KNOWN SPECIES  
OF *GASTROSTICTA* CASEY, 1918 AND  
*PARAFERONINA* BALL, 1965 (COLEOPTERA:  
CARABIDAE: *PTEROSTICHUS* BONELLI, 1810)**

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*Abstract.*—Three new species of Pterostichini from North America are described: *Pterostichus enodis* (type locality: Texas), and *P. mutoides* (type locality: Georgia) which belong to the subgenus *Gastrosticta* Casey, 1918, and *P. spathifer* (type locality: Isabella Creek, Clearwater Co., Idaho) which is a member of the subgenus *Pseudoferonina* Ball, 1965. Three species of *Gastrosticta* are redescribed: *P. obesulus* LeConte, 1873; *P. punctiventris* Chaudoir, 1878; and *P. ophryoderus* Chaudoir, 1878. *Pterostichus amnicola* (Casey, 1918) is listed as a new junior synonym of *P. punctiventris* (Chaudoir, 1878). A key to all known species of *Gastrosticta* is included.

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The purpose of this paper is to provide names for three undescribed species of *Pterostichus* Bonelli belonging to the subgenera *Gastrosticta* Casey and *Pseudoferonina* Ball and redescribe three species of *Gastrosticta* previously known only from the original descriptions. The new species are described herein so that the names could be used in a forthcoming publication dealing with the supraspecific classification of the North American Pterostichini. As members of *Gastrosticta* and *Pseudoferonina* are rare in collections, I hope this publication will stimulate anyone interested in North American Carabidae to collect and study these beetles.

Acronyms used in this publication are as follow: CAS—California Academy of Sciences, San Francisco, California; CMNH—Carnegie Museum of Natural History, Pittsburgh, Pennsylvania; CNC—Canadian National Collection, Ottawa, Ontario; MCZ—Museum of Comparative Zoology, Cambridge, Massachusetts; MNHP—Muséum National d'Histoire Naturelle, Paris; UASM—University of Alberta Strickland Museum, Edmonton, Alberta; UICM—Department of Plant, Soil & Entomological Sciences, University of Idaho, Moscow, Idaho; USNM—United States National Museum (Natural History), Washington, DC.

**Subgenus *Gastrosticta* Casey, 1918**

*Gastrosticta* Casey, 1918:323. Type species: *Feronia ventralis* Say, 1823, by original designation.

*Gastrosticta* is one of the most poorly known North American subgenera of *Pterostichus*. It includes ten species: *P. ventralis* (Say, 1823); *P. putus* Casey, 1913; *P. sayanus* Csiki, 1930 [replacement name for *P. obscurus* (Say, 1834)]; *P. subacutus* (Casey, 1918); *P. tumescens* LeConte, 1863; *P. obesulus* LeConte, 1873; *P. punctiventris* (Chaudoir, 1878); *P. ophryoderus* (Chaudoir, 1878); and the two species described in this paper. The group is restricted to the temperate regions of eastern United States.



According to Ball (1960) members of this subgenus live in dry, open, coniferous woodlands; all species are brachypterous.

Adults of *Gastrosticta* are distinguished from those of other North American Pterostichini by the laterally punctate sterna in combination with the absence of scutellar stria, lack of seta on the hind trochanter, glabrous last tarsomere, and poorly developed metatarsal carina. All these character states are apotypic within the Pterostichini; likely *Gastrosticta* is a monophyletic taxon.

Three species of this group, *P. obesulus*, *P. punctiventris*, and *P. ophryoderus*, are known only from the original descriptions which are difficult to interpret. These species are redescribed herein along with two new species; a key to the species of the subgenus is also provided.

*Pterostichus obesulus* LeConte, 1873

*Pterostichus obesulus* LeConte, 1873:314. Type locality: Georgia.

**Diagnosis.** Unique among the species of *Gastrosticta* by the characteristic shape of the pronotum (Fig. 2) with the lateral depressions explanate basally.

**Description.** Habitus (Fig. 1). **Coloration.** Body rufopiceous to piceous dorsally; antennae, palpi, legs, lateral margins of pronotum and sometimes first elytral intervals testaceous to dark ferrugineous; elytra iridescent. **Microsculpture.** Frons with poorly impressed, isodiametric meshes. Pronotum with very transverse meshes. Elytra with linear microsculpture (i.e., meshes linear, narrow, parallel, with few anastomoses). **Head.** Frontal impressions shallow, more or less parallel, impunctate. **Pronotum** (Fig. 2). Widest around middle; sides rounded on posterior half; posterior angles rounded; lateral bead thickened basally; lateral depression explanate basally; base not or faintly and partly margined laterally; laterobasal impression single, short, shallow, punctate; area between laterobasal impression and lateral margin depressed. **Elytra.** Moderately long (index length elytra/length pronotum = 2.06–2.28); sixth and seventh striae not impressed, at most suggested; striae punctate, except on apical fourth and sometimes also on basal fourth; intervals convex; second discal setigerous puncture on or near second stria. **Legs.** Apical spur of fore tibia markedly dilated laterally. **Ventral parts.** Proepisternum without punctures. Metepisternum punctate. Sternum VII with punctures medially, punctation as dense as on lateral areas. **Aedeagus.** Median lobe with short apex, apical lamella rounded (Fig. 8); right paramere elongate, markedly curved apically (Fig. 8).

Length of body: 8.1–9.5 mm.

**Type material.** LeConte's collection in MCZ includes a single specimen under the name of *P. obesulus*. The specimen, a female, bears the following labels: "Ga/ Horn Coll H554/ *P. obesulus* LeC/ Lectotype MCZ 32326/ Designated 1975 R.T.Allen/ UAIC 00015001." LeConte's original description was based on a single specimen since he wrote (1873:314) "I have seen only the specimen kindly communicated by Dr. Horn." The specimen therefore is the holotype (by monotypy).

**Distribution.** The species is known from Georgia, Florida, and Louisiana. In addition to the holotype, I have seen five specimens of this species from the following localities. **Florida:** "Fla", Liebeck (MCZ) 1; Alachua Co., Gainesville, 29.I.1972, D. R. Whitehead (UASM) 1; idem, 9–17.IV.1986, G. Gibson (CNC) 1; boundary of



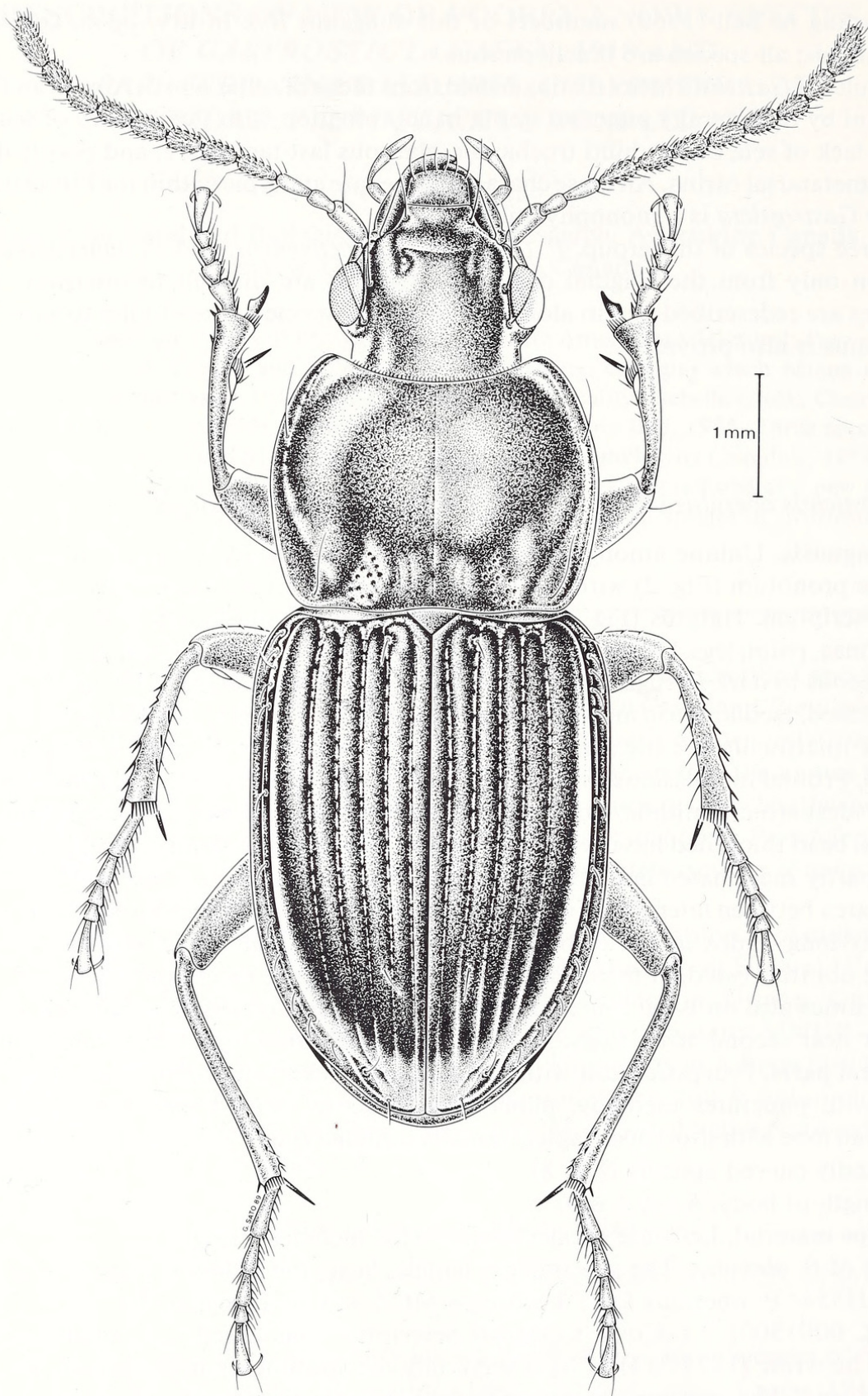
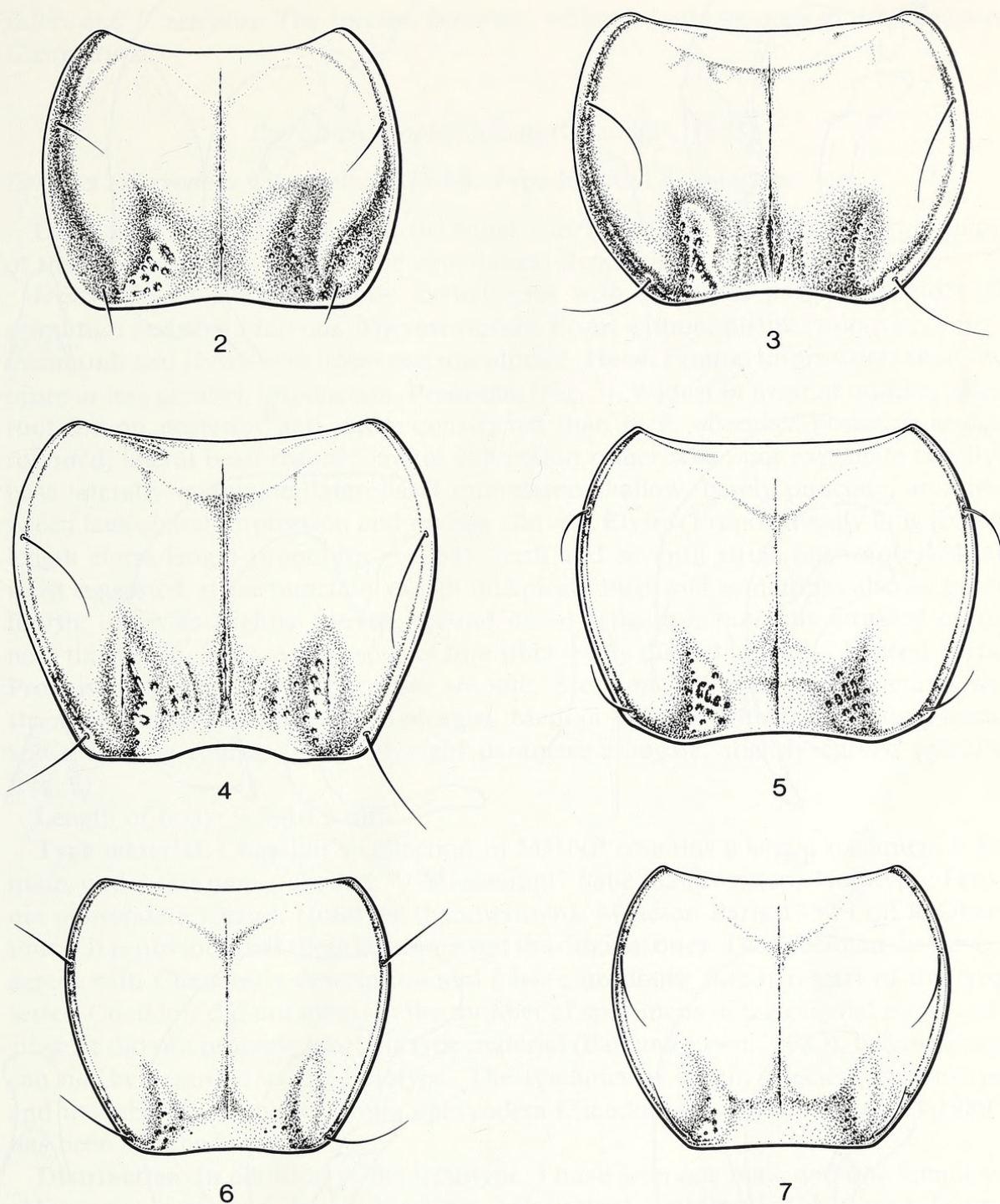


Fig. 1. *Pterostichus obesulus* LeConte, female.



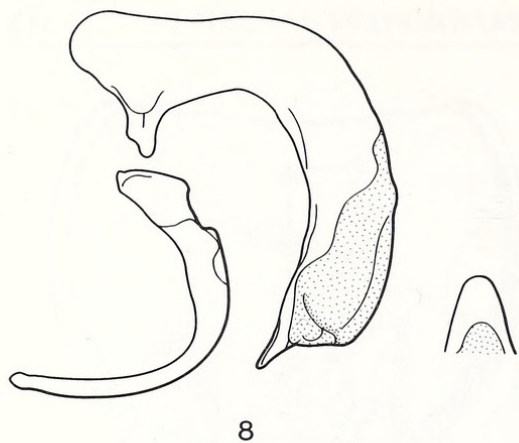


Figs. 2–7. Pronotum. 2. *Pterostichus obesulus*; 3. *P. ophryoderus* (lectotype); 4. *P. punctiventris* (lectotype); 5. *P. mutoides* (paratype); 6. *P. ventralis*; 7. *P. putus* (lectotype).

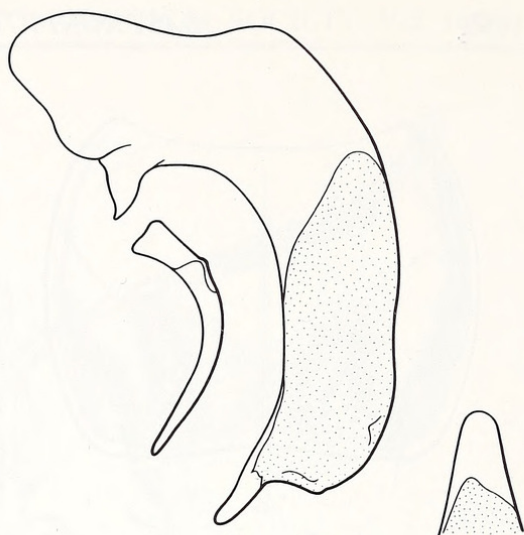
Levi-Alachua Co., 14–16.IV.1986, G. Gibson (CNC) 1. Louisiana: “La”, Liebeck (MCZ) 1.

**Comments.** LeConte (1873:307) originally included *P. obesulus* in his section D of the genus *Pterostichus* along with *P. fallax* (Dejean, 1828) and *P. sculptus* LeConte, 1852. Lindroth (1966:535) did not study any specimens of *P. obesulus* and, following LeConte, included the species in *Abacidus* LeConte, a group that contains both *P.*

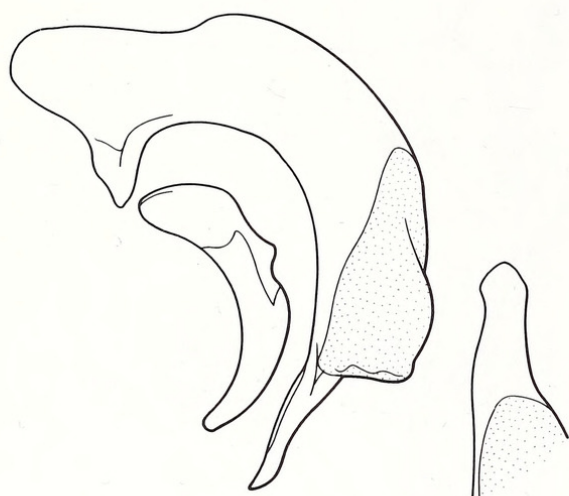




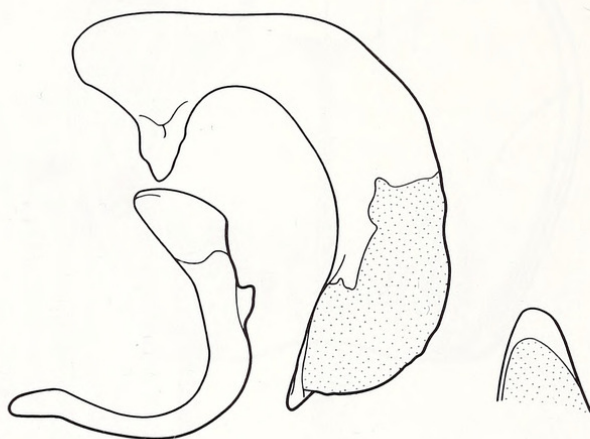
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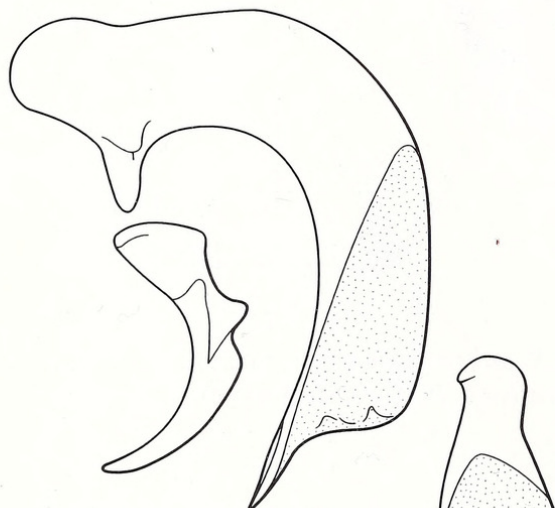
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10



11



12



13



14

2.5 mm

Figs. 8–14. Median lobe (left lateral view), right paramere, and apical lamella. 8. *Pterostichus obesulus* (Gainesville, Florida); 9. *P. ophryoderus* (5 mi S. Toomsuba, Mississippi); 10. *P. sayanus* (Charleston, Illinois); 11. *P. enodis* (holotype); 12. *P. mutoides* (holotype); 13. *P. ventralis* (neotype); 14. Apical lamella of median lobe of *P. putus* (lectotype).



*fallax* and *P. sculptus*. The species, however, without doubt belongs to the subgenus *Gastrosticta*.

*Pterostichus ophryoderus* (Chaudoir, 1878)

*Feronia ophryodera* Chaudoir, 1878:64. Type locality: Mississippi.

**Diagnosis.** Distinguished from the other *Gastrosticta* by the characteristic shape of the pronotum (Fig. 3) with the wide lateral depressions.

**Description. Coloration.** Body ferrugineous with antennae, palpi, legs, sides of pronotum and elytra fulvous. **Microsculpture.** Frons without distinct microsculpture. Pronotum and elytra with linear microsculpture. **Head.** Frontal impressions shallow, more or less parallel, impunctate. **Pronotum** (Fig. 3). Widest in front of middle; sides rounded on posterior half, more constricted than in *P. obesulus*; posterior angles rounded; lateral bead regular; lateral depression rather wide, not explanate basally; base laterally marginate; laterobasal impression shallow, barely punctate; area between laterobasal impression and margin convex. **Elytra.** Proportionally long (index length elytra/length pronotum = 2.54); sixth and seventh striae not impressed, at most suggested; striae punctate, except on apical fourth and sometimes also on basal fourth; intervals slightly convex; second discal setigerous puncture situated on or near third stria. **Legs.** Apical spur of fore tibia feebly dilated laterally. **Ventral parts.** Proepisternum and metepisternum smooth. Sternum VII with few punctures restricted to anterolateral areas. **Aedeagus.** Median lobe with moderately long apex, apical lamella rounded (Fig. 9); right paramere elongate, slightly curved apically (Fig. 9).

Length of body: 9.7–10.2 mm.

**Type material.** Chaudoir's collection in MHNP contains a single specimen, a female, under this name labelled: "“Mississippi” Sallé (handwritten)/Holotype/ *Feronia ophryodera* Chaud. Holotype (handwritten)/ Muséum Paris 1952 Coll R Oberthur." It is obvious that these labels are not the original ones. The specimen, however, agrees with Chaudoir's description and I have no doubt that it is part of the type series. Chaudoir did not mention the number of specimens in the original series and, since he did not properly label his type material (Ball and Erwin, 1983), the specimen can not be regarded as the holotype. The specimen is herein selected as lectotype and the label "Lectotype *Feronia ophryodera* Chaudoir Des. by Y. Bousquet 1989" has been attached to it.

**Distribution.** In addition to the lectotype, I have seen one male and one female of this species from the following localities. **Mississippi:** Lauderdale Co., 5 mi S Toomsuba, U.S. 11, 14.VI.1965, R. Freitag & D. Larson (CNC) 1; Rankin Co., Flowood, 28.II.1988, D. & M. Hildebrandt (Hildebrandt Coll.) 1 [cypress swamp on banks of Pearl River].

*Pterostichus punctiventris* (Chaudoir, 1878)

*Feronia punctiventris* Chaudoir, 1878:66. Type locality: Texas.

*Gastrosticta amnicola* Casey, 1918:372 (**New Synonymy**). Type locality: St. Louis, Missouri.



**Diagnosis.** Distinguished by the combination of having the sides of the pronotum obliquely convergent in posterior half, the elytral microsculpture transverse, and the second discal seta in or close to second stria.

**Description. Coloration.** Body ferrugineous with antennae and palpi fulvous; tibiae darker than femora. **Microsculpture.** Frons with poorly impressed, isodiametric meshes. Pronotum and elytra with transverse meshes. **Head.** Eyes less convex than in *P. obesulus*. Frontal impressions shallow, more or less parallel, impunctate. **Pronotum** (Fig. 4). Widest in front of middle; sides obliquely convergent on posterior half; posterior angles obtuse; lateral bead regular; lateral depression not explanate basally; base marginated laterally; laterobasal impression slightly longer, deeper and more punctate than in *P. obesulus*; area between laterobasal impression and margin convex. **Elytra.** Proportionally long (index length elytra/length pronotum = 2.42–2.48); sixth and seventh striae feebly impressed on anterior half, more so on posterior half; striae punctate, except on apical fourth and sometimes also on basal fourth; intervals slightly convex; second discal setigerous puncture situated on or near second stria. **Legs.** Apical spur of fore tibia feebly dilated laterally. **Ventral parts.** Proepisternum impunctate or with few punctures anteriorly. Metepisternum punctate. Sternum VII smooth medially or with few punctures, punctation if present much sparser than on lateral areas. **Aedeagus.** Apical lamella rounded apically much like that of *P. ventralis* (cf. Fig. 13); right paramere more or less elongate, slightly curved apically (as in Fig. 12).

Length of body: 9.7–10.2 mm.

**Type material.** Chaudoir's collection in MHNP contains a single specimen under this name, a female labelled: "“Texas” Schmeltz. (handwritten)/ Holotype/ *Feronia punctiventris* Chaud. Holotype (handwritten)/ Muséum Paris 1952 Coll R Oberthur." As for the preceding species, it is obvious that these labels are not the original ones. The specimen, however, agrees with Chaudoir's description and I have no doubt that it is part of the type series. It is selected herein as lectotype and the label "Lectotype *Feronia punctiventris* Chaudoir Des. by Y. Bousquet 1989" has been attached to it.

Casey's collection in USNM contains two specimens under the name *Gastrosticta amnicola*. One of them, a male labelled "MO./ *Gastrosticta amnicola* Csy (handwritten)/ Type USNM 47116/ Casey bequest 1925/ UAIC 00044070/ Lectotype *Gastrosticta aminicola* [sic!] by (handwritten) R. T. Allen," was selected lectotype by Allen (1977).

**Distribution.** In addition to the type material, I have seen 2 specimens of this species in the CNC. **Arkansas.** Stone Co., Blanchard Springs St. Park, 18.V.1973, Kavanaugh & Goulet. **Missouri.** St. Louis Co., Ranken, 4.X.36, E. P. Meiners.

**Comments.** I have found no external character states to distinguish the type specimens of *P. amnicola* (Casey) from the lectotype of *P. punctiventris* (Chaudoir). Therefore, *Gastrosticta amnicola* Casey, 1918 is herein considered as a junior synonym of *Feronia punctiventris* Chaudoir, 1878.

#### ***Pterostichus enodis*, new species**

**Diagnosis.** Distinguished from other species of *Gastrosticta* by the rather well impressed sixth and seventh elytral striae.



**Description. Coloration.** Body black with antennae, palpi, and legs rufopiceous. **Microsculpture.** Frons without distinct microsculpture. Pronotum and elytra with linear microsculpture. **Head.** Frontal impressions deeper than on preceding species, more or less parallel, punctate. **Pronotum.** Widest at middle; sides rounded on posterior half; posterior angles rounded; lateral depression not explanate basally; laterobasal impression short, shallow, faintly punctate; area between laterobasal impression and lateral margin convex. **Elytra.** Moderately long (index length elytra/length pronotum = 2.18); sixth and seventh striae impressed, as much as, or nearly as, fifth stria; striae punctate in basal half; intervals convex; second discal setigerous puncture on or near second stria. **Legs.** Apical spur of fore tibia markedly dilated laterally. **Ventral parts.** Proepisternum punctate on anterior half; metepisternum impunctate. **Aedeagus.** Median lobe with short apex, apical lamella rather rounded (Fig. 11); right paramere markedly curved apically (Fig. 11).

Length of body: 10.8 mm.

**Type material.** Holotype. Texas: "Tex/ Henry Ulke Beetle Coll. CMNH Acc. No. 1645/ Holotype *Pterostichus enodis* Bousquet." The specimen is deposited in the CMNH.

The specimen, a male, has lost the last 2 left antennomeres, the last 2 left labial palpomeres, the right maxillary palpus, the tibia and tarsus of the right front, left middle and right hind legs, and the tarsus of the right middle and left hind legs.

**Distribution.** The species is known only from the holotype collected in Texas.

**Etymology.** The specific name is derived from the Latin adjective *enodis*, *e* (without knots, smooth). It refers to the fact that the integument of the species is smooth and polished, the microsculpture on the pronotum and elytra being of the linear type.

**Comments.** The shape of the median lobe and particularly the markedly curved apical half of the right paramere suggest that this species and *P. obesulus* are probably sister species.

### ***Pterostichus mutoides*, new species**

**Diagnosis.** Separated from the other *Gastrosticta* by the characteristic shapes of the pronotum (Fig. 5) and of the median lobe (Fig. 12).

**Description. Coloration.** Body ferrugineous with antennae, palpi, epipleura, tibiae, and tarsi flavous. **Microsculpture.** Frons without distinct microsculpture. Pronotum with very transverse meshes, meshes poorly impressed and distinct only by spots. Elytra with transverse meshes. **Head.** Frontal impressions shallow, more or less parallel, impunctate. **Pronotum** (Fig. 5). Widest in front of middle; sides straightly convergent on posterior half; posterior angles markedly obtuse; lateral bead regular; lateral depression not explanate basally; laterobasal impression short, shallow, punctate; area between laterobasal impression and lateral margin convex. **Elytra.** Proportionally long (index length elytra/length pronotum = 2.40); sixth and seventh striae feebly impressed; striae impunctate; intervals slightly convex; second discal setigerous puncture on or near second stria. **Legs.** Apical spur of fore tibia feebly dilated laterally. **Ventral parts.** Proepisternum impunctate. Metepisternum with few punctures. Sternum VII with punctation restricted to anterolateral areas. **Aedeagus.** Median lobe with moderately long apex, apical lamella with minute jag (Fig. 12); right paramere more or less elongate, slightly curved apically (Fig. 12).



Length of body: 9.6–10.0 mm.

**Type material.** Holotype. Georgia: "Ga./ Holotype *Pterostichus mutoides* Bousquet." The specimen lacks the tarsus of the right middle leg.

One paratype labelled "Ga/ Paratype *Pterostichus mutoides* Bousquet." The holotype is deposited in the CMNH, the paratype in the CNC.

**Distribution.** The species is known only from the type material collected in Georgia.

**Etymology.** The specific name is derived from the specific name *mutus* and the suffix *oides* (like, resembling); it refers to the fact that the adults superficially look like those of *P. mutus*, a species of the subgenus *Bothriopterus* Chaudoir.

#### KEY TO SPECIES OF *GASTROSTICTA*

The key is preliminary and is given to facilitate the interpretation of the species described above.

1. Frontal impressions deep, grooved, distinctly divergent posteriorly. Laterobasal impressions of pronotum deep, convergent posteriorly ..... 2
- Frontal impressions superficial, not grooved, more or less parallel in most species; if moderately deep and slightly divergent posteriorly, then laterobasal impressions of pronotum superficial and more or less parallel ..... 3
- 2(1). Sides of pronotum rounded on posterior half; posterior angles minutely denticulate ..... *P. subacutus* (Casey)
- Sides of pronotum straightly convergent on posterior half; posterior angles obtuse ..... *P. tumescens* LeConte
- 3(1). Second discal puncture of elytron in or close to third stria ..... 4
- Second discal puncture of elytron in or close to second stria ..... 5
- 4(3). Elytral striae smooth. Microsculpture on elytra slightly transverse. Apical lamella of median lobe rather long, more or less triangular apically (Fig. 10) .... *P. sayanus* Csiki
- Elytral striae punctate, punctures rather small and sparse but distinct. Microsculpture on elytra linear. Apical lamella of median lobe rather short, rounded apically (Fig. 9) ..... *P. ophryoderus* (Chaudoir)
- 5(3). Sixth and seventh striae clearly impressed in basal half, as much, or nearly so, as fifth stria ..... *P. enodis*, new species
- Sixth and especially seventh striae indistinct, or much less impressed in basal half than fifth stria ..... 6
- 6(5). Lateral depression of pronotum explanate basally (Fig. 2); base of pronotum not or faintly and partly marginate laterad of laterobasal impression. Right paramere markedly curved in apical half (Fig. 8) ..... *P. obesulus* LeConte
- Lateral depression of pronotum regular, not explanate basally (Figs. 4–7); base entirely and distinctly marginate laterad of laterobasal impression. Right paramere at most slightly curved in apical half (Figs. 12–13) ..... 7
- 7(6). Elytra without microsculpture, except on apical fourth. Last visible sternite with punctures medially, punctation as dense as that on lateral areas ..... 8
- Elytra with microsculpture all over. Last visible sternite with very few punctures medially or without punctures, punctation if present much sparser than that on lateral areas ..... 9
- 8(7). Pronotum markedly constricted basally (Fig. 6); greatest width at or near level of anterolateral seta. Apical lamella of median lobe with rounded apex (Fig. 13) .... *P. ventralis* (Say)
- Pronotum less constricted basally (Fig. 7); greatest width behind level of anterolateral seta. Apical lamella of median lobe slightly distorted to right (Fig. 14) .. *P. putus* Casey



- 9(7). Pronotum with sides regularly rounded in posterior half (Fig. 5); basal margin extending medially beyond level of laterobasal impression . . . . . *P. mutoides*, new species  
 – Pronotum with sides rather obliquely convergent in posterior half (Fig. 4); basal margin not extending medially beyond level of laterobasal impression . . . . .  
 . . . . . *P. punctiventris* (Chaudoir)

#### Subgenus *Pseudoferonina* Ball, 1965

*Pseudoferonina* Ball, 1965:107. Type species: *Pterostichus lanei* Van Dyke, 1925, by original designation.

Members of the subgenus *Pseudoferonina* are known only from the states of Idaho, Oregon, and Washington. Six species have been described: *P. vexatus* Bousquet, 1985; *P. shulli* (Hatch, 1949); *P. lanei* Van Dyke, 1925; *P. humidulus* (Van Dyke, 1943); *P. smetanai* Bousquet, 1985; and *P. campbelli* Bousquet, 1985. A key to these species was published recently (Bousquet, 1985); a new species from Idaho is described herein.

#### *Pterostichus spathifer*, new species

**Diagnosis.** Adults of this species are externally similar to those of *P. shulli* and can be differentiated only by the examination of the median lobe of the aedeagus (see Figs. 15–16). In *P. spathifer* the median swelling on the left side of the median lobe is less rounded, the submedian sinuosity is slightly more anterad, and the apex is wide, spoonlike, and slightly distorted to the right.

**Description. Coloration.** Dorsal surface of body black; antennae and legs rufous to rufopiceous; palpi usually rufous. **Microsculpture.** Frons with isodiametric meshes. Pronotum and elytra with moderately transverse meshes. **Pronotum.** Sides oblique to sinuate in posterior half; anterior angles markedly produced; posterior angles right to obtuse; outer laterobasal impressions slightly to distinctly impressed; inner laterobasal impressions punctate. **Legs.** Mesotibia of male slightly curved apically. **Ventral parts.** Sternum VII of male with shallow, medial depression more or less delimited anteriorly by arcuate carina. **Aedeagus** (Fig. 15). Left side of apical portion of median lobe (in left lateral view) sinuate submedially; apex of median lobe (in left lateral view) wide, spoonlike; apical portion of median lobe (in ventral view) with lightly sclerotized diagonal band.

Length of body: 10.0–10.8 mm.

**Type material.** Holotype (male). Idaho: "Idaho, Clearwater Co. Isabella Creek, 1,700', S31, T41N, R7E, nr N.Fk. Clearwater River, 17.IX.1984, P. J. Johnson, J. B. Johnson." The specimen is deposited in the CAS.

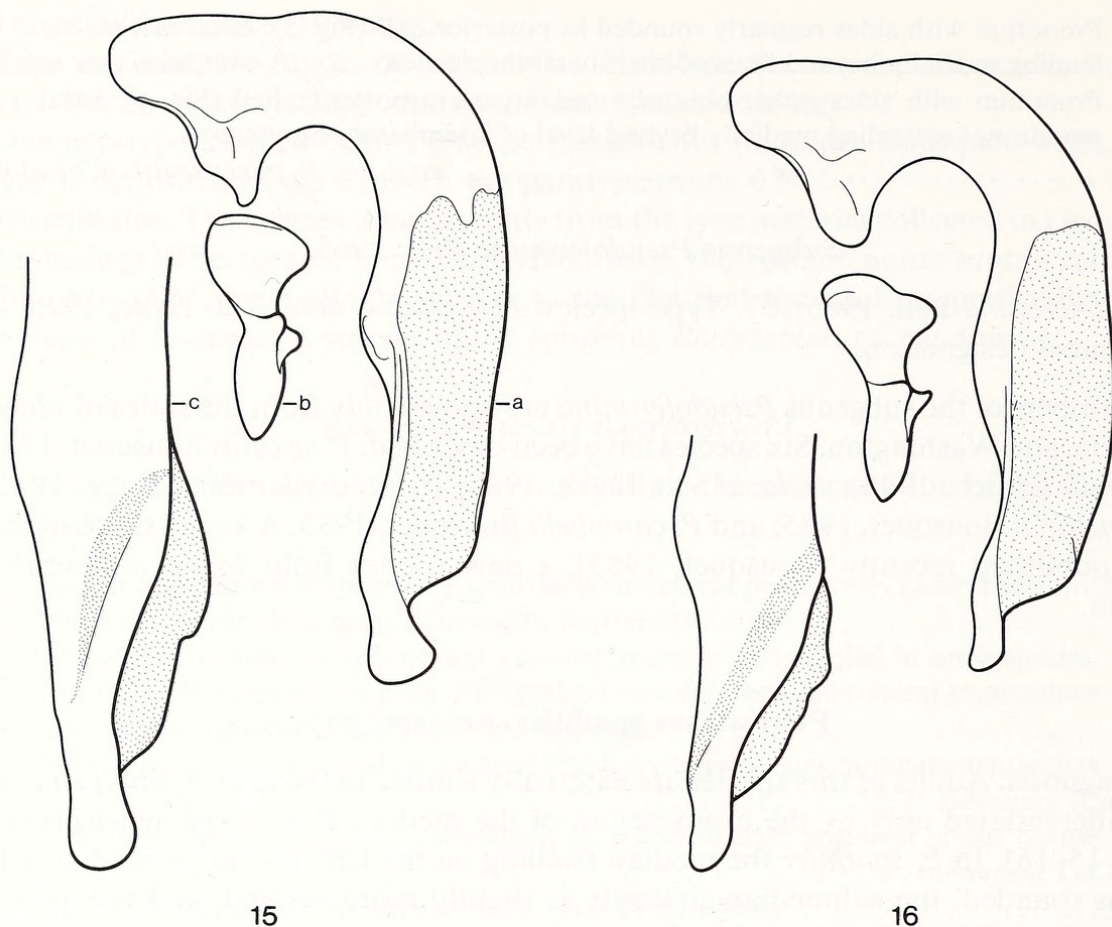
Paratypes. Idaho: same data as holotype (8 males, 9 females), or date 24.VI.1985 (8 males, 8 females). The specimens are deposited in the CNC (10 specimens), USNM (5), CAS (7), UICM (6) and P.J. Johnson's collection (5).

**Distribution.** The species is known only from the type-locality in Idaho.

**Habitat.** All specimens were collected under alluvial cobbles partly imbedded in sand and partly covered with moss in a seasonally mostly dry side channel of Isabella Creek (P. Johnson, pers. comm.).

**Etymology.** The specific name is derived from the Latin noun *spatha*, -ae, f (spoon)





Figs. 15–16. Median lobe (left lateral view), right paramere, and apical half of median lobe (ventral view). 15. *P. spathifer* (holotype); 16. *P. shulli* (holotype).

and the verb *ferre* (to bear). It refers to the spoonlike apex of the median lobe in left lateral view.

**Comments.** To include the new species in Bousquet's key (1985), the following changes should be made.

- 3. Median lobe of aedeagus in left lateral aspect strongly sinuate behind middle ..... 3'
- Median lobe of aedeagus in left lateral aspect not sinuate behind middle .....  
..... *P. lanei* Van Dyke
- 3'. Median lobe of aedeagus with apex wide, spoonlike, and slightly distorted to right in left lateral aspect (Fig. 15) ..... *P. spathifer*, new species
- Median lobe of aedeagus with apex narrower, not spoonlike, and rather straight in left lateral aspect (Fig. 16) ..... *P. shulli* (Hatch)

#### ACKNOWLEDGMENTS

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