

*Operculina talara* W. Berry n.sp.

Fig. 8.

Test small, 1.58 mm. in diameter and 0.5 m. thick, ratio of diameter to thickness 3.16:1. Test much thicker at center than at periphery. Surface ornamented with raised suture lines. Test starts with poorly defined nucleoconch then makes about 3 very slowly increasing coils, the last coil containing about 22 chambers. The septa are slightly curved convexly outward except their outward ends where they are strongly bent backwards. The walls are very heavy often being about  $\frac{1}{3}$  the height of the chambers in thickness and the septa about  $\frac{1}{5}$  the width of the chambers in thickness.

*Cotypes*.—Collection of Willard Berry No. O-9.

*Occurrence*.—Talara shale, 958 feet above base; northwestern Peru.

*O. talara* seems to bear a slight resemblance to *O. vaughani* Cushman, described from the Ocala limestone and the Brito formation, in the number of coils and the number of chambers in the last coil. Otherwise they differ greatly. The new form is easily recognized by the extremely thick walls of the chambers.

*Operculina samanica* W. Berry n.sp.

Fig. 2.

Test medium, 2.34 mm. in diameter and 0.40 mm. thick, ratio of diameter to thickness 5.68:1. Entire test about the same thickness. Surface smooth except for slightly raised suture lines. Test starts with a poorly defined nucleoconch, then makes about  $3\frac{1}{2}$  gradually increasing coils, the last coil containing 28 chambers. The septa are curved convexly outward, the outer end often curving a little more sharply than the rest.

*Cotypes*.—Collection of Willard Berry No. O-8.

*Occurrence*.—Talara shale, 958 feet above base; northwestern Peru.

*O. samanica* might be confused with *O. peruviana* W. Berry but it has a greater number of chambers in the last coil and the septa are much less curved and more regular.

ENTOMOLOGY.—*New genera and species of leafhoppers related to Scaphoideus*.<sup>1</sup> E. D. BALL, University of Arizona.

The writer in preparing a paper on the food plants, life histories and larval characters of the species of *Scaphoideus* was impressed with the fact that there were a number of groups included that were structurally distinct and in a number of cases had quite distinct food habits and ecological relationships. It appeared to be necessary, therefore, to recognize these groups, describe some new species and discuss some apparent synonymy before such a paper could be satisfactorily prepared.

<sup>1</sup> Received November 14, 1931.



KEY TO THE GENERA OF NORTH AMERICAN FORMS FORMERLY INCLUDED IN THE GENUS *Scaphoideus*.

- A. Ocelli small, close to the eyes—elytral nervures not minutely interrupted with white.
  - B. Central anteapical cell strongly constricted and divided, two cross nervures and usually a definite saddle-like marking. . . . 1. **Sanctanus** n. gen.
  - BB. Central anteapical not divided, a single cross nervure, except rarely in *Scaphoideus* (*sensus strict.*), no definite saddle marking.
    - C. One to three supernumerary oblique veinlets to costa in the region of the outer anteapical. The outer claval distant from the inner margin of clavus, then bent suddenly at nearly a right angle on approaching the margin (an oblique dark mark often obscuring it and making it appear to be reflexed), usually 2 or 3 lobate ivory areas along suture.
      - D. No reticulations along claval suture or costa (except as above), outer anteapical cell oblique. Male plates terminating abruptly. . . . . 2. **Scaphoideus** Uhl.
      - DD. Claval suture and costa heavily reticulate. Outer anteapical cell parallel with costa. Male plates with filamentous appendages. . . . . 3. **Prescottia** n. gen.
      - CC. No extra veinlets to costa in the region of the outer anteapical cell which is parallel to costa. Claval veinlets normal. Male plates with attenuate appendages. . . . . 4. **Osbornellus** n. gen.
  - AA. Ocelli large, about equidistant from eyes and apex of vertex, outer apical parallel with costa, nervures interrupted with minute white points. . . . . 5. **Portanus** n. gen.

Genus **Sanctanus** Ball n. gen.

Resembling *Scaphoideus* (*sensus strict.*) in the long antennae and in the posterior bristles in groups, more nearly the shape of *Aligia*, especially in the broader face and broader elytra. Strikingly distinct from either in the presence of the second cross nervure between the sectors, and the constricted and divided central anteapical cell. The outer anteapical is usually narrow at both ends and there is usually one or more reflexed veinlets to costa as well as extra reticulations in some cells. The vertex is shorter or about equalling the length of the pronotum, rounding or angular, the disc very slightly convex, meeting the front in an acute angle. The front is broad above, narrowing rapidly with straight sutures to the narrow clypeus, which is slightly wedge-shaped and narrowing towards the apex rather than expanding as in *Scaphoideus* and *Aligia*. Most species have a saddle pattern of marking which obscures the venation.

Type of the genus, *Scaphoideus sanctus* Say

This genus will include *sanctus* Say (= *picturatus* Osb.), *fasciatus* Osb. (= *neglectus* Osb.), *cruciatus* Osb., *orbiculatus* Ball, *Deltocephalus aestuarians* De L. & S., *D. limicolus* Osb., *D. eburneus* DeL., *D. fusconotatus* Osb., and probably one or two others that have been described as species of *Deltocephalus*. They are, however, far removed from that group in habits, food-plants and relationships. An examination of the types and long series shows no character that will warrant separation of *neglectus* from *fasciatus*.



**Sanctanus orbiculatus** Ball n. sp.

Resembling *sanctus* but smaller with a shorter vertex and narrower light band. Reddish salmon with white markings and four black spots on vertex margin. Length ♀ 5 mm. ♂ 4 mm.

Vertex obtusely angled, broader than long, resembling *fasciatus*, the margin rounding over at the ocelli and only becoming angled with the front at the apex. Front and clypeus as in *sanctus* the front more inflated. Elytra very long and slender and easily broken at apex. Venation of *sanctus* nearly, the central anteapical constricted but only occasionally divided. Female segment with a slight median production. Male valve very broad, rounding; plates long actually triangular with the extremely long slightly curved black styles appearing beyond.

*Color.* Reddish salmon above and below with black and white markings. Vertex white with a short angular line under the apex and two spots above, the ocelli in a pair of large spots and a still larger pair at the base, sometimes wanting in the male. Pronotum and scutellum pale in the female, reddish salmon in the male. Elytra pale salmon with a smoky cast in the female, reddish salmon in the male. The scutellar margins broadly white in the female. A narrow white band across the bases of the anteapicals, the nervures beyond it white with smoky margins, a narrow smoky apical band and a large round eye-like black spot in the second apical cell.

Holotype ♀ allotype ♂ and twelve paratypes all taken by the writer at Patagonia, Arizona, Sept. 7, 1929.

A strikingly distinct species by the salmon color and the eye spot.

**Genus SCAPHOIDEUS** Uhl

To this genus as defined by its type *immistus* belong only those forms with the outer anteapical cell oblique, the anterior "base" usually carrying a group of about three oblique veinlets to the costa. The commissure usually has a broad ivory white stripe that is divided into two or three lobes by oblique dark lines. These lines occur near the apices of the claval nervures and have been mistaken for the nervures themselves and thus the nervures have been described as "strongly hooked." By use of transmitted light one discovers that the outer claval nervures while at some distance from the margins are strongly bent and approach the margin at nearly right angles regardless of the direction of the dark markings.

There are a number of very closely related species in this group whose specific limits will not be accurately defined until their food plants have been determined and good series of known origins are available for study. Where such series have been secured restricted variation has been found to be the rule and constant characters can be defined.

The species may be roughly divided into three groups, as follows:

1. *Face generally pale.* There may be some irregular color besides the dark lines above but the general ground color is pale. To this group belongs *productus* Osb. (*carinatus* Osb. and *magnus* Osb.) apparently a single very large and distinct species easily recognized by the vertex marking and broad



short male plates shown for *magnus* by Osborn; *immistus* Say (including var. *incisus* Osb. which was never described) var. *minor* Osb. apparently a distinct species, *cyprius* Ball, *paludosus* Ball, *ochraceous* Osb., *intricatus* Uhl and *triunatus* Ball.

2. *Face black or brown.* There may be light areas in a few cases but the general color is dark. To this group belongs *sensibilis* Ball, *nigricans* Osb., *inundatus* Ball, *melanotus* Osb. (which appears to be a definite and constantly marked species), *obtusius* Osb. and *cinerosus* Osb., which appear to represent a single gray form, and *atlantus* Ball.

3. *Face uniformly tawny or reddish rather than dark.* To this group belongs *opalinus* Osb., *littoralis* Ball, and *luteolus* V. D., three species whose food habits are definitely known. The face color of *opalinus* was not described. It is darker than that of the pronotum, pale brown with a fulvous or coppery reflection.

#### **Scaphoideus immistus var. titanus Ball n. var.**

Form and structure of the species, calvus and adjacent corium dark brown or black with the lobate areas and one or more pairs of ivory spots in sharp contrast. Vertex ivory with a very narrow transverse band tawny, pronotum and scutellum pale cinereous with only traces of light markings. Elytra very dark except for the ivory marking, the apex with a broad smoky band. The costal area and an area before the apical cells pale with the nervures broadly smoky. Face and below pale, female with two black lines below vertex margin and traces of two dark areas on front; male with one brown line and traces of another.

Holotype ♀ Morgantown, West Virginia, August 12. Allotype ♂ Toronto, Ontario, August 8, 1921, and one paratype male, Fairmont, West Virginia, August 21, 1927.

This is either a striking color variety or a distinct species of which we should know more.

#### **Scaphoideus cyprius Ball n. sp.**

Size and general form of *immistus* but with an almost uniformly coppery shade slightly darker than in *luteolus*. Face pale. Length ♀ 5.5-6 mm., ♂ 5 mm.

Vertex about as in *intricatus*, right-angled or very slightly acute, shorter in the male. Elytra as in *immistus*, the venation similar. Female segment with the posterior margin rounding or slightly angularly produced and dark marked. Male valve inconspicuous, plates together long, narrow, spoon-shaped. Pygofers in both sexes with four tufts of black bristles.

*Color.* Pale coppery, vertex ivory, a narrow black line on anterior margin and a rather narrow transverse tawny band. Pronotum and scutellum tawny shading to coppery, a faint transverse ivory band just back of the eyes and a definite yellowish ivory band back of the suture of the scutellum. Elytra almost uniform coppery, the nervures scarcely darker except in the region of the costal and anteapical cells, a narrow elongated lobate spot and two pairs of irregular areas in the inner anteapical cells ivory, and the nodal cells milky. Face and below creamy, the females with two and the males with one dark line under the vertex margin. The males are paler than the females.

Holotype ♀ and two paratypes females August 7, 1897. Allotype ♂ and two paratype females July 14, 1896, three paratypes July 20 and July 30, 1896 and August 9, 1895, all taken at Ames, Iowa by the writer.



Examples of this species were mixed with those of *intricatus* and it was only when the following species was being compared that the mistake was discovered.

**Scaphoideus paludosus** Ball n. sp.

Resembling *cyprius* in form and general coloring, broader with a broader shorter head, tawny with ivory spots and lobate markings. Length ♀ 6 mm. ♂ 5 mm.

Vertex right-angled, length equalling its basal width, shorter than the pronotum. Elytra proportionally broader than in *cyprius* with the venation similar. The claval nervures approaching each other and sometimes united by a cross nervure. Outer anteapical cell oblique but rarely stylate (as in allotype). Three reflexed veinlets from its basal half. Female segment with the posterior margin very slightly rounding and lacking the black band. Male plates slightly shorter and broader at the apex than in *cyprius*.

*Color.* Tawny, slightly more orange than in *luteolus*, with a light creamy face. Vertex ivory with a narrow tawny band that has a median point. Pronotum tawny with an indistinct ivory band behind the eyes. Scutellum pale tawny with the apical third lighter, margined by two black dots. Elytra tawny with rusty nervures before the apical cells, a narrow but definite smoky band at the apex and a few dark dots. Two lobate areas along the commissure and two or three pairs of ivory spots. Face and all below creamy white, two narrow black lines below the vertex margin in both sexes.

Holotype ♀ Sanford, Florida, July 20, 1927 (Ball). Allotype ♂ Bradenton, Florida, June 11, 1928 (W. E. Stone), and two paratypes females Sanford, July 10 and 29, 1926 (Ball & Stone) and one female Plant City, Florida, June 23, 1926 (Dr. Baer), all taken along the margins of deep swamps.

**Scaphoideus triunatus** Ball n. sp.

Size of *magnus*, nearly, but more slender, general appearance of *sensibilis*, four broad transverse brown bands set off by five broad white ones on dorsum of body. Length ♀ 6 mm. ♂ 5.25 mm.

Vertex definitely acutely angular, more than half its length before the eyes, equalling the pronotum in length. Elytra narrowly appressed, giving a slender appearance. Venation as in *immistus*, the outer anteapical cell oblique but rarely pointed or stylate posteriorly, rarely more than two oblique nervures to costa from its base. What appears to be a second cross nervure often present. Female segment rounding and black-bordered posteriorly, male valve as long as wide, acutely rounding. The plates together extremely long spoon-shaped, the apices rounding and clothed with fine hairs.

*Color.* General color slightly tawny brown, males lighter. Vertex, pronotum, and scutellum ivory white with four broad transverse brown bands as follows: one like a flying bird across the middle of vertex, a second covering the anterior fourth of pronotum, an interrupted one dividing the remainder of the pronotum, and a broader one occupying the basal half of the scutellum.

Elytra subhyaline with heavy rusty nervures, a black cloud at apex, a smoky cloud across and behind the cross nervure and another surrounding the three definite lobate ivory areas along the commissure. Face and below white, a single black line below the vertex margin in the male, a pair in the female, as in *ochraceus*.



Holotype ♀ allotype ♂ and twelve paratypes taken by the writer July 17, 1929, at Granite Dells, Arizona.

**Scaphoideus atlantus** Ball n. sp.

Similar to *immistus* in form and structure, larger. Size and general appearance of *auronitens*. Dark copper with three pairs of black dots and no lobate areas along commissure. Length ♂ 5 mm.

Vertex (in male) obtusely angulate, one-half longer than against eye, about two-thirds the length of pronotum. Elytra long narrow appressed. Venation of the *immistus* type obscured by the coppery shade, no cross nervure on clavus, the outer anteapical cell oblique but narrowing about equally at each end with three reflexed nervures to costa from the basal half. Male valve obtusely rounding, plates together twice as long as their basal width scarcely narrowing before the abrupt, slightly oblique apices.

*Color.* Vertex ivory before the eyes with a definite black line on the margin, a broad tawny band on the disc shading out posteriorly to leave a creamy line at the base. Pronotum uniform dark coppery, scutellum a little paler with two black dots at apex. Elytra of a uniform dark copper tint with a broad apical band smoky, the nervures just before this rusty, the remainder obscure, three pairs of black dots along the commissure. Face pale brown with a coppery reflection, a black line under vertex margin bordered on both sides with ivory, below this traces of one or two pale arcs on the front. Legs and below white, the venter dark.

Holotype ♂ Glassboro, New Jersey, July 29, 1927.

This is so strikingly distinct in this group and so near like *auronitens* except for the vertex markings and venation that it was thought best to describe it from a single example in hopes that others might be found in collections and lead to a food-plant record.

**Scaphoideus sensibilis** Ball n. sp.

A large black species resembling *magnus* in size and *nigricans* in color but with more definite alternation of ivory and black. Length ♀ 6 mm., ♂ 5 mm.

Vertex right-angled the apex rounding, less pointed than in *magnus* with a more definite notch in the posterior border. Pronotum as in *immistus*. Elytra long, inclined to be appressed. Venation as in *magnus* but with the central anteapical cell more constricted, the outer cell longer and narrower with the two ends nearer alike. Female segment long, narrowing posteriorly, the posterior margin angularly produced one-third the length of the segment, the lateral margins of the produced portion concave, the apex obtusely triangular, whole produced part shining black, the black extending half way to the base on the median line. Male valve short and obtuse, plates together long and narrow, nearly twice longer than wide, their apices individually bluntly rounding and clothed with long silky hairs.

*Color.* Dark, the darkest species in the group. Vertex ivory, the usual narrow submarginal black line in front, a transverse band across the middle dark brown or black. This band is narrow at the anterior angle of the eye and broadens to the middle, the posterior margin is rounding, the anterior margin convex on each side of an acute median projection. The whole is the outline of a bird in flight, occupying less than one-third of the ivory disc.



Pronotum black, a curved mark enters from each posterior angle, a broad quadrangular transverse band just before the middle, a little longer than the width of vertex, a narrow median light line. Scutellum with a large median shield of ivory, slightly clouded with brown in front, a pair of large black spots just inside the basal angles and a pair of points at apex. Elytra heavily clouded with smoky brown and black emphasized on nervures and apex, omitting two lobate median ivory spots and about four pairs along the claval sutures. A hyaline area along costa. Face black, the front smoky with one broad ivory line below the vertex, two narrow light ones and a few partial arcs below that. Legs and all below white except for the tarsal joints and the apex of female segment.

Holotype ♀ July 10, 1926, allotype ♂ July 16, 1926, and 20 paratypes taken at Sanford, Florida, from June 19 to July 16, 1926, by W. E. Stone, J. A. Reeves and the writer.

*Scaphoideus inundatus* Ball n. sp.

Resembling *immistus*, slightly smaller, darker, with a longer segment and a smoky face. Length ♀ 5 mm., ♂ 4.5 mm.

Vertex, as in *immistus*, very slightly acutely angled, almost as long as pronotum. Elytra long, appressed. Venation as in *immistus*, the claval nervures approaching and often united by a cross nervure, outer anteapical cell oval, smaller at the base than in *immistus* and only slightly or not at all stylated. Female segment normal in length, posterior margin roundly produced from just inside the lateral angles into an obtuse projection that is broadly black-marked. Male valve small obtuse, plates together elongated, broadly spoon-shaped, much exceeded by the slender elongate pygofer.

*Color.* General color brown with a tawny cast, darker than *immistus* or *melanotus* but not as dark as *sensibilis*, nor with as definite light markings. Vertex creamy back to the line of the eyes, then tawny brown shading out to creamy at the base. Pronotum smoky brown with a faint quadrangular light band before the middle. Scutellum tawny, the apex ivory with four black dots on margin. Elytra slightly milky, subhyaline, heavily washed with smoky brown on the nervures and in some of the cells. The lobate ivory areas large with heavy black markings anterior to them, a broad smoky band at apex. Face uniform pale brown, a broad ivory band margined by two narrow black ones under the vertex margin and a few pale areas on front below these. Legs white with the usual black annuli on tarsi.

Holotype ♀ allotype ♂ and 4 paratypes taken with them June 9, 1928 and ten paratypes taken from April 25 to July 31, by W. E. Stone and the writer at Sanford, Florida.

This species is smaller than typical *immistus* but considerably larger than *minor*. The constant dark smoky face will at once separate it from these species. From *melanotus* it is readily separated by the larger size, longer vertex and lack of definite black on face.

*Scaphoideus littoralis* Ball n. sp.

Similar to *opalinus* in form but more tawny, not as tawny as *luteolus* and more definitely marked. Length ♀ 5.5 mm., ♂ 4.75 mm.

Vertex about as in *opalinus*, slightly more acutely angulate, definitely longer than in *luteolus*. Elytra slightly longer than in *opalinus*. Venation similar,



the outer anteapical cell longer and not as wide, narrowing posteriorly, often pointed or stylate; central anteapical cell very broad near base, slightly narrower in center than at apex. Female segment typical, the posterior margin roundly produced nearly one-third the length and shining black on the produced portion. Male valve triangular, plates elongate, their apices individually rounding, both plates and valves clothed with fine hairs.

*Color.* Pale tawny with an opalescent shade on the elytra. Vertex creamy with a tawny cast, the usual sub-marginal black line, a broad band behind the middle, pale tawny. Pronotum pale tawny with an opalescent cast, traces of a quadrangular band anterior to the middle. Scutellum tawny with a pair of faint stripes, a pair of dots in the basal angles and a transverse band behind the suture, ivory. Elytra tawny opalescent, an apical smoky band extending to just before the cross nervures. The nervures are mostly rusty brown and there are two lobate ivory spots on the commissure and ivory spots on the claval sutures as in *opalinus*. Face pale; slightly smoky in the female, with three dark bands below the vertex margin; creamy with a single band in the male. Legs and below white or pale, the disc of the abdomen and rings on the tarsi dark.

Holotype ♀ allotype ♂ and twelve paratypes taken at Woods Hole, Massachusetts, by the writer, July 11, 1925.

#### Genus *Prescottia* Ball, n. gen.

Resembling *Scaphoideus* in the long antennae, the lobate commissure, and the posterior angle of the outer claval nervure. Similar to *Osbornellus* in the outer anteapical paralleling the costa. Related to *Twiningia* in the reticulations along the costa and claval suture.

Head narrower than the pronotum, vertex angular, broad and flat or concave with a sharp margin, forming an acute angle with the straight front. Front slightly broader than in *Scaphoideus*. Elytra long and appressed. Venation similar to *Scaphoideus* except that the outer anteapical is parallel with the costa and has about five reflexed veinlets to costa and an equal number along the costal area. The cells are more or less reticulate before the apical, especially emphasized along the claval suture but no definite second cross nervure is apparent.

Type of the genus, *Scaphoideus lobatus* V.D.

#### *Prescottia brickellia* Ball n. sp.

Resembling *lobata* but much larger, darker with a broader head, a much broader vertex with a definite black line beneath the acute margin. Length ♀ 7 mm., ♂ 5.5 mm.

Vertex very slightly acutely angulate, as long as its basal width in the female, shorter in the male, the margin acute. Front broader than in *lobata*, elytra with the same type of reticulate venation, usually a few more veinlets to costa. Female segment about as in *lobata*, the posterior margin more produced and heavily black-marked. Male plates broadly rounding, then attenuately produced.

*Color.* Vertex creamy with a fulvous cast, traces of a line around the anterior margin, a transverse band just back of the anterior margin of the eyes, a shorter one half way between this and the apex. Pronotum and scutellum creamy with a fulvous shade. Pronotum with heavy brown irroration, especially on the submargin. Scutellum with orange in the angles, a pair



of spots on the disc and another pair at apex. Elytra with the scutellar margin and two lobate spots on the commissure ivory. The remainder heavily inscribed with brown, a smoky cloud on the apex. The scutellar margin is not as broadly ivory as in *lobata* and the anterior lobate spot is elongate instead of almost circular.

Holotype ♀ allotype ♂ and fifteen paratypes taken by the writer at Granite Dell, Arizona, July 17, 1929.

Genus *Osbornellus* Ball, nov. gen.

Resembling *Scaphoideus* in size and form with the long antennae and narrow front but lacking the oblique anteapical cell, the extra veins to costa and the claval veins are normal.

Head slightly narrower than the pronotum, enclosing the anterior third. Vertex flat, angled in front and forming an acute angle with the narrow face. Elytra long, the venation simple, regular, a single cross nervure. The claval veins normal, not forming an exaggerated angle posteriorly, the outer anteapical cell parallel to costa. A single veinlet at or near each end, these together with the apex of the third apical nervure broadened and reflexed to costa. Female segment simple, the posterior margin straight or only slightly rounding. Male plates elongated into filamentous or plumose processes.

Type of the genus, *Scaphoideus auronitens* Prov.

To this genus *auronitens* Prov., *ritanus* Ball, *consors* Uhl., (= *scalaris* V.D.) *jucundus* Uhl., *cocanus* Ball, *albonotatus* V.D. and *unicolor* Osb. of our fauna have been referred and this seems to be the dominant group in the more tropical regions.

*Osbornellus ritanus* Ball, nov. sp.

Resembling *auronitens* in size and general form but with a shorter vertex, with the anterior line definitely concave on either side the apex, and no red markings. Length ♀ 6 mm., ♂ 5.75 mm.

Vertex shorter than in *auronitens*, but the apex nearly as acute because the side margins are definitely concave rather than straight or rounding as in that species. The margin appears to be thicker but this is probably due to the concavity of the lateral margins allowing the black line below the margin to be visible from above. Elytra as in *auronitens*, the three reflexed nervures to costa much broader, the anterior nervure arising at the base of the outer anteapical or only slightly anterior to it instead of some distance along the costal cell as is frequently the case in *auronitens*. Female segment slightly produced, the pygofer with fine, almost downy hairs instead of bristles as in *auronitens*. Male plates rather broad at base and black-lined, roundly narrowing to long filamentous white tips; pygofer black-tipped but lacking the divergent black pencils of the former species.

Color of *auronitens*, slightly darker throughout, entirely lacking the red markings and the second black band on vertex. The anterior band narrower, curved or broken around the ocelli, concave before the apex allowing the band below to appear, basal markings of vertex as in *consors* ending in a spot on the suture before the middle. Pronotum pale brown with a pair of points on the submargin. Three pairs of dark points on the commissure, a smoky band at the apex of elytra, the costal veinlets and often a few areas in the discal cells brown. Face pale smoky shading to light below, a single irregularly curved black line below the vertex margin instead of a straight one as in *auronitens*.



Holotype ♀ allotype ♂ and one paratype, Huachuca Mountains, June 15, 1930. Four paratypes from the same place, August 2, 1931. One from the Chiricahua Mountains July 6, 1930 and two from the Santa Rita Mountains, May 11, 1930 and June 30, 1929, all collected by the writer and all from high elevations in Arizona.

**Osbornellus cocanus** Ball, n. sp.

Resembling *jucundus* but much smaller and narrower with a longer and more acutely angled vertex. Rich fulvous with oval milky spots. Length ♀ 4.75 mm., ♂ 4 mm.

Vertex flat, right-angled, the apex a little rounding, as long as the pronotum, a little longer than its basal width, while in *jucundus* it is definitely shorter. Angle with face extremely acute, not more than two-thirds as wide as in *jucundus*, the margin thick and set off by two definite black lines. Elytra short, appressed, venation as in *jucundus*, the anterior costal nervure arising from the outer anteapical cell some distance from the base. Female segment short and slightly rounding posteriorly. Male plates narrower than in *jucundus* with thread-like appendages longer than the pygofers.

*Color.* Light yellow with ivory spots and tawny or red mottling. Vertex with a white line on suture at apex bisecting the dark marginal line, an elongate triangle on suture at base. Outside of these are two broad slightly oblique red stripes slightly obscured in the female. Pronotum irregularly washed with tawny, scutellum tawny with seven white points. Elytra tawny shading to subhyaline on the margin, the nervures definitely rusty, growing darker posteriorly, a brown cloud in the apical cells. Face tawny.

Holotype ♀ Cocoa May 5, 1926, allotype ♂ Sanford, May 1, 1927, and two paratype males Sanford, May 12, 1926 and May 14, 1927. All taken in Florida by W. E. Stone and the writer.

This is a beautiful little species about half the size of *jucundus*.

**Genus Portanus** Ball, n. gen.

Resembling *Scaphoideus* in general form and appearance. Venation as in *Osbornellus*. Strikingly distinct from either in the round white spots along the nervures and the ocelli located in slight pits almost halfway from the eye to the apex of vertex.

Head definitely narrower than the body, enclosing one-half the pronotum. Vertex flat between the eyes, then rounding over and joining with the inflated front in an obtusely pointed cone, with the large ocelli in pits above the margin half way to the apex. Antennae elongate as in *Scaphoideus*, set in a deep pit or groove formed by the inflated front. Front convex in both diameters, nearly parallel margined until just before the apex. Elytra extremely long and narrow. Venation regular, the cells long and narrow, the outer anteapical extremely long, parallel with the costa, nervures to costa short straight. Female segment short and truncate.

Type of the genus, *Scaphoideus stigmatosus* Uhl.

Uhler's species was described from the West Indies. Examples of what is apparently *mexicanus* Osb. from Guatemala have been compared with the type of *stigmatosus* and are no doubt the same. *S. longicornis* Osb. from Bolivia also belongs to this genus.



Genus *TWININGIA* Ball

The author has previously referred *Scaphoideus blandus* Ball, *pellucidus* Ball (= *irroratus* Osb.) *fumidus* Ball and *bicolor* Ball to this genus and described *magnata* and *malvastra*. These forms are related to *Mesamia* rather than to *Scaphoideus*.

PALEONTOLOGY.—*A new species of Cancer from the Pliocene of the Los Angeles basin.*<sup>1</sup> MARY J. RATHBUN, National Museum.

From Prof. U. S. Grant, University of California, Los Angeles, has been received for report a species of *Cancer* unlike any hitherto described.

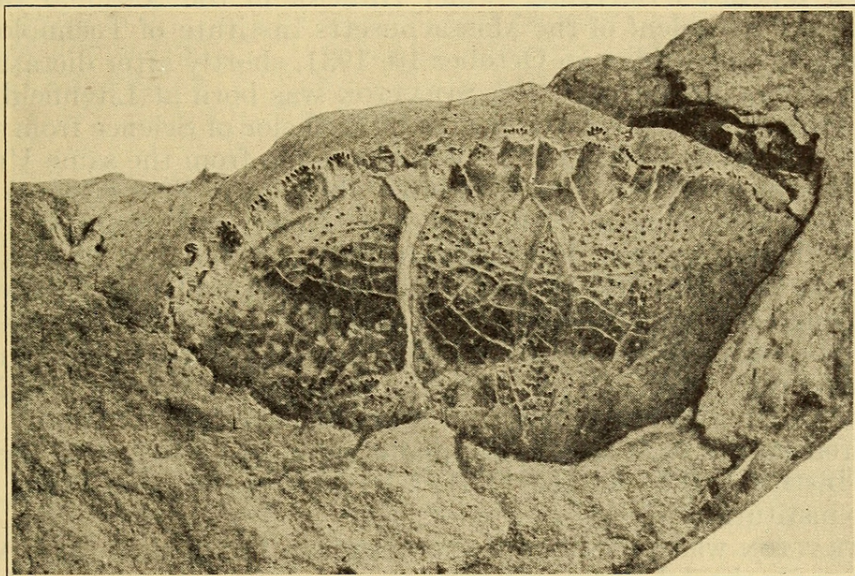


Fig. 1. *Cancer granti* Rathbun, sp. nov. Anterior portion of carapace,  $\times 1\frac{1}{2}$ .

*Cancer granti* Rathbun, sp. nov.

Fig. 1.

A portion of the anterior half of the carapace is exposed; surface thickly covered with minute punctae; granules visible to the naked eye are loosely scattered in groups on the protogastric, mesogastric, hepatic and epibranchial regions; a tubercle behind inner angle of orbit; interregional grooves shallow; anterior and antero-lateral margins bordered by elongate granules or blunt spinules; lateral teeth upturned; the second tooth from the orbit is narrow, little more than half as wide as the third tooth; fourth and fifth teeth subequal, slightly narrower than third; the surface of the front between orbits has 3 longitudinal furrows, the margin is obscure. Estimated width of carapace 56.5 mm.

<sup>1</sup> Received November 23, 1931.





Ball, E. D. 1932. "New genera and species of leafhoppers related to Scaphoideus." *Journal of the Washington Academy of Sciences* 22, 9–19.

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