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Leafhoppers (Hemiptera: Cicadellidae) associated with the renosterbos, *Elytropapus rhinocerotis* Less. I. The genus *Renosteria* Theron

by

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Twelve new species of *Renosteria* are described: *R. ceresensis, R. waverena, R. goudinica, R. overbergia, R. cangica, R. hoekoensis, R. karosella, R. albanensis, R. hantamensis, R. cedarana, R. piquetia* amd *R. montagua.* All species of this genus are strictly confined to the renosterbos and are generally restricted to certain geographical regions; some are however sympatric. The distribution of the species in relation to the occurrence of the host plant is discussed.

The renosterbos, *Elytropappus rhinocerotis* Less., is one of the commonest plants in the southern part of the Cape Province and a true member of the native Cape flora (Levyns 1956). Its presentday distribution ranges from Namaqualand to the eastern Cape region, with a few inland extensions. As was noted by Omer-Cooper & Shiff (1955), a large indigenous insect fauna is associated with it and they named 21 species of insects as feeding habitually on the renosterbos. Apart from the Cicadellidae described here, I have collected several other species of insects on the bushes, e.g. the bladder locust *Physemacris variolosus* L., the aphrophorid *Sepullia nigropunctata* Stål, the tingids *Cochlochila theroni* Rodrigues, *C. zetana* Drake, *C. minuscula* Rodrigues, *C. nemesiae* Rodrigues, *Sanazarius cuneatus* Distant, *Cnemiandrus typicus* Distant and *Cysteochila incolana* Drake, and Fulgoroidea belonging to the genera *Oliarus* Stål, *Capena* Stål, *Juba* Jacobi and *Risius* Stål. In different localities different species of the coccid genus *Tachardina* Cockerell are also commonly found on the renosterbos and in heavily infested plants the bare stems become jet black because of the growth of a sooty mould on the honey dew secreted by the coccids. This probably gave rise to the name 'Swartland' for the Malmesbury area, where the renosterbos grew in great abundance in early times.

Intensive sweeping and beating of renosterbos in many (about 130) localities during the past few years, have yielded an astonishing variety of cicadellid species, belonging to several genera and each usually restricted to definite localities. The assistance rendered during the various collecting expeditions by T. G. Swanepoel, M. Stiller and G. F. H. Höppner is gratefully acknowledged. I wish to thank Dr. R. G. Fennah of the British Museum for identifying the aphrophorid and the Fulgoroidea, and Dr. P. D. Rodrigues of the Museu e Laboratório Zoologico e Antropológico, Lisbon for studying the Tingidae.

Holotypes are deposited in the South African Museum, Cape Town and paratypes in the British Museum, University of Stellenbosch Collection and the National Collection of Insects, Plant Protection Research Institute, Pretoria. In the figures, homologous structures are drawn to the same scale in the different species.

Renosteria Theron, 1974

Head wider than pronotum and somewhat depressed (Figs 40 & 41). Crown medially elongated and apex rounded or fairly sharply angled in front; discal region smooth and slightly depressed; frontal region shagreened. Coronal suture not less than half median length of crown. Face broader than long, with very broad frontoclypeus (Fig. 39). Genae weakly notched below eyes and very narrow below lora.

Pronotum medially as long as crown or slightly shorter. Tegmen (Fig. 36) sometimes with mcu_2; three closed ante-apical cells then present; appendix narrow. Spinulation of fore tibiae 1 + 4 and hind femoral setal formula 2 + 2 + 1.

Middorsal incision of pygofer by articular membrane of anal tube variable; sometimes deep, so that pygofer lobes are dorsomedially connected only by transverse bar (Fig. 1); sometimes shallow, so that pygofer is long middorsally (Fig. 4). Tip of aedeagus ensheathed by anal tube in repose. Tenth tergite well sclerotized. Each pygofer lobe posteriorly always with brush of macrosetae (only alveoli usually shown in figures), and variously developed, acuminate, heavily sclerotized, usually ventrally directed process internally at posterodorsal margin. Plates as long as or longer than pygofer lobes and with numerous irregularly-arranged macrosetae ventrolaterally. Valva triangular. Aedeagus symmetrical, with pair of appendages arising from base; shaft sometimes recurved; gonopore at or near apex. Connective with short broad stem articulating with socle; basal arms well separated. Style usually with fairly distinct preapical angle and hooked apophysis. Hind margin of seventh abdominal sternite of female notched medially, but exhibiting some intraspecific variation.

Type-species: *Chlorotettix spadix* Naudé, 1926

This genus forms part of the tribe Athysanini, is endemic to the Cape and has some relatives among other, as yet undescribed, indigenous genera of leafhoppers. The species of *Renosteria* are all fairly similar in size and display considerable intraspecific colour variation. A considerable number of the specimens studied were parasitized by Pipunculidae (Diptera), without affecting the male genitalia profoundly, however.

Key to species of *Renosteria*

1 Pygofer deeply invaded middorsally by articular membrane of anal tube, pygofer lobes sometimes dorsally connected only by transverse bar (Fig. 1) 2
— Pygofer long middorsally, not invaded for more than half its length (2/3 in *hantamensis*) by articular membrane of anal tube (Fig. 4) 6
2 Aedeagus very small, with short, delicate appendages arising from socle (Fig. 17); aedeagal shaft and connective equal in length ..... **goudinica**
— Aedeagus and appendages much longer, with shaft distinctly longer than connective 3
3 Aedeagal appendages associated with base of shaft (Fig. 23); hind margin of 7th abdominal sternite of female fairly deeply notched medially (Fig. 27) ..... **overbergia**
— Aedeagal appendages definitely arising from socle (Fig. 2) hind margin of 7th sternite weakly notched in female (except in *cangica*) 4
4 Pygofer lobes rounded behind; shaft of aedeagus with characteristic pair of small hooks at apex (Fig. 29) ..... **cangica**

— Pygofer lobes triangular behind (Fig. 12); shaft of aedeagus different 5
5 Pygofer lobes narrow, sharply triangular; aedeagal appendages strong, arising some distance from base of shaft and apices not contiguous with shaft (Fig. 2) ..... **spadix**
— Pygofer lobes fairly broad, short, not extending beyond plates; aedeagal appendages thin, arising close to base of shaft and often contiguous with shaft (Fig. 10) ..... **waverena**
6 Aedeagal appendages and shaft intimately associated (Figs 7 & 66) 7
— Aedeagal appendages far removed from base of shaft, arising from lower part of socle 8
7 Aedeagal shaft and appendages straight (Fig.7) ..... **ceresensis**
— Aedeagal shaft and appendages strongly recurved (Fig. 66) ..... **piquetia**
8 Shaft of aedeagus clavate in lateral view (Figs 55, 57, 75, 76, 77) 9
— Shaft of aedeagus not clavate in lateral view 10
9 Aedeagus large, with massive, gutter-shaped shaft curving anteriorly (Fig. 57); dorsal apodeme of socle short and contiguous with shaft; connective large ..... **cedarana**
— Aedeagus smaller; shaft slenderer (Figs 55, 75, 76, 77) dorsal apodeme of socle diverging from shaft; connective normal ..... **hantamensis**
10 Aedeagal appendages closely parallel and normally in contact with apical half of shaft (Figs 35, 44, 50, 74) 11
— Aedeagal appendages not in contact with apex of shaft (Fig. 73) ..... **montagua**
11 Shaft of aedeagus long, narrow in dorsal view, with gonopore at simple rounded apex (Figs 35, 74) ..... **hoekoensis**
— Shaft of aedeagus broader in dorsal view and apex with small lateral flanges and tiny sinuate lip below gonopore (Fig. 43) ..... **karosella**
— Shaft of aedeagus very broad; apex with large, rounded funnel surrounding gonopore (Fig. 49) ..... **albanensis**

Renosteria spadix (Naudé), Figs 1–2

Chlorotettix spadix Naudé, 1926: 77–78
Tetartostylus spadix (Naudé); Linnavuori, 1961: 483
Renosteria spadix (Naudé); Theron, 1974: 148

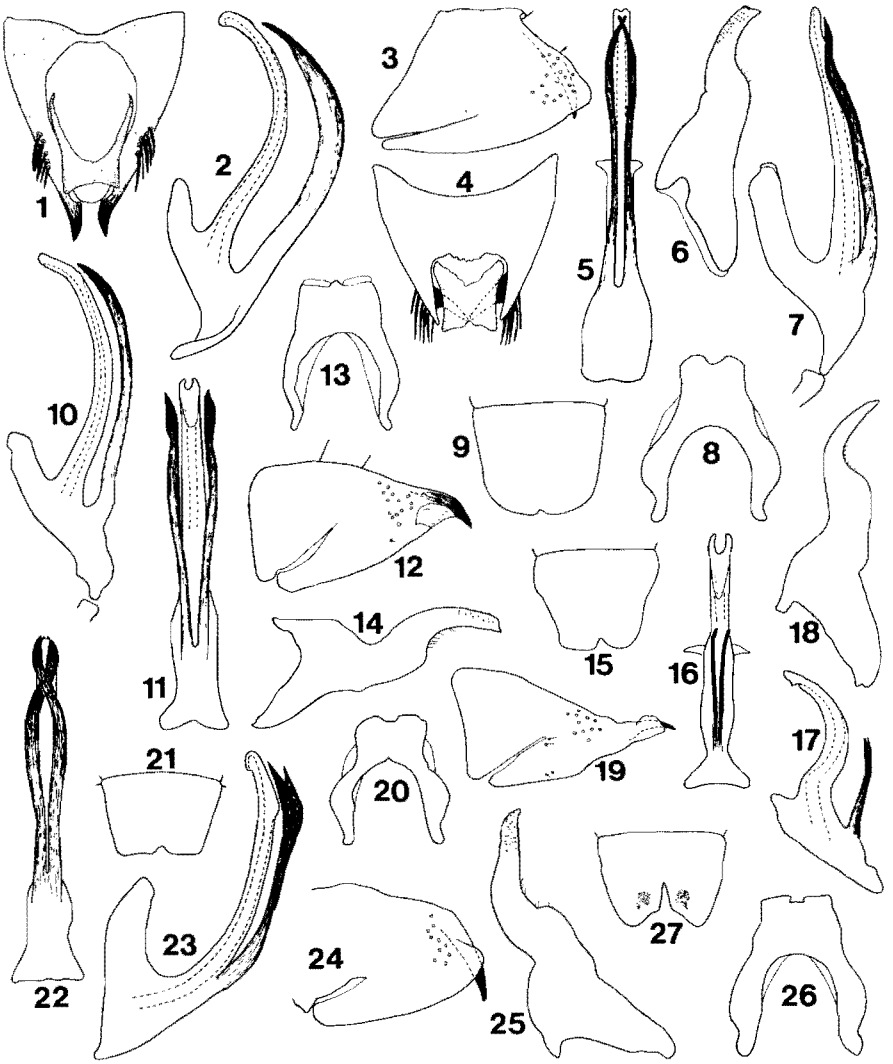
Specimens of this species, which was described and figured earlier (Theron 1974), were examined from Ceres (Theronsberg), De Doorns and Matjiesfontein.

Renosteria ceresensis sp. nov., Figs 3–9

MALE. Length from apex of crown to tips of tegmina 3,36–3,88 mm; transocular width 1,06–1,16 mm; greatest width of pronotum 0,92–1,06 mm. Crown fairly sharply produced and median length varying from 1,00–1,25 times length of pronotum. Head, pronotum and scutellum yellowish, with disc of crown sometimes whitish. Tegmina yellowish-green, with apices of anteapical and apical cells smoky.

Pygofer middorsally incised for about half its length by anal tube membrane (Fig. 4). Tenth tergite relatively short. Pygofer lobe relatively short and bluntly angled behind (Fig. 3); pygofer process slightly curved and directed ventromedially. Aedeagal shaft relatively straight (Figs 5 & 7); appendages arising from base of shaft closely adpressed to its posterior side. Dorsal apodeme of socle about half length of shaft. Connective as in Fig. 8 and style as in Fig. 6.

FEMALE. Length 3,52–3,68 mm; transocular width 1,08–1,16 mm; greatest width of pronotum 0,98–1,06 mm. Seventh abdominal sternite as in Fig. 9.



Figs 1–27. *Renosteria* spp. 1–2. *R. spadix* (Naudé). 1. Pygofer of ♂, lateral view. 2. Aedeagus, lateral view. 3–9. *R. ceresensis* spec. nov. 3–8. ♂ Holotype. 3 & 4. Pygofer, lateral and dorsal views. 5. Aedeagus, ventral view. 6. Style. 7. Aedeagus, lateral view. 8. Connective. 9. Seventh abdominal sternite of ♀. 10–15. *R. waverena* spec. nov. 10–14. ♂ Holotype. 10 & 11. Aedeagus, lateral and ventral views. 12. Pygofer, lateral view. 13. Connective. 14. Style. 15. Seventh abdominal sternite of ♀. 16–21. *R. goudinica* spec. nov. 16–20. ♂ Holotype. 16 & 17. Aedeagus, ventral and lateral views. 18. Style. 19. Pygofer, lateral view. 20. Connective. 21. Seventh abdominal sternite of ♀. 22–27. *R. overbergia* spec. nov. 22–26. ♂ Holotype. 22 & 23. Aedeagus, ventral and lateral views. 24. Pygofer, lateral view. 25. Style. 26. Connective. 27. Seventh abdominal sternite of ♀.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Theronsberg, Ceres, 21.v.1975, J. G. Theron. Paratypes: 3 ♂, 1 ♀, same data as holotype; 1 ♂, 1 ♀, Ceres, 1.iv.1975, J. G. Theron; 8 ♂, 3 ♀, Theronsberg, Ceres, 1.iv.1975, J. G. Theron; 4 ♂, 1 ♀, Theronsberg, Ceres, 12.iv.1976, J. G. Theron; 2 ♂, 2 ♀, below Gydo Pass, Ceres, 2.xii.1981, J. G. Theron.

REMARKS. This species appears to be confined to the Ceres valley. In the Theronsberg region it is sympatric with *R. spadix*.

Renosteria waverena sp. nov., Figs 10–15

MALE. Length from apex of crown to tips of tegmina 3,36–3,68 mm; transocular width 1,04–1,12 mm; greatest width of pronotum 0,92–1,00 mm. Crown medially as long as pronotum. Crown and pronotum yellowish-green. Costal region of tegmen yellowish-green anteriorly, hyaline posteriorly. Clavus with milky areas marginally, but remainder of tegmen brownish, semi-opaque.

Anal tube deeply invading pygofer, so that latter is very short middorsally. Pygofer lobe triangular, with well developed, curved, posteriorly directed pygofer processes (Fig. 12). Aedeagal appendages arising from socle close to shaft (Fig. 10) and apices sometimes contiguous with shaft. Dorsal apodeme of socle less than one third length of shaft. Connective as in Fig. 13 and style as in Fig. 14.

FEMALE. Length 3,56–3,88 mm; transocular width 1,08–1,22 mm; greatest width of pronotum 1–1,10 mm. Seventh abdominal sternite as in Fig. 15.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Weltevrede, Wolseley, 13.xii.1972, J. G. Theron. Paratypes: 9 ♂, 2 ♀, same data as holotype; 2 ♂, Slagboom, Ceres, 26.i.1982, J. G. Theron; 14 ♂, 2 ♀, Steinthal, Tulbagh, 19.v.1973, J. G. Theron; 4 ♂, Grootvlei, Tulbagh, 17.xii.1981, J. G. Theron; 3 ♂, La Plaissant, 2.xii.1981, J. G. Theron; 4 ♂, Romansrivier, 2.xii.1981, J. G. Theron; 2 ♂, Breërivier Station, 18.i.1982, J. G. Theron; 3 ♂, Voëlvlei, Tulbagh, 17.xii.1981, J. G. Theron; 1 ♂, 1 ♀, Hermon, 30.x.1974, J. G. Theron; 13 ♂, 6 ♀, Kromme Rhee, Stellenbosch, 23.xii.1971, J. G. Theron; 1 ♂, Elsenburg, Stellenbosch, 23.xii.1971, J. G. Theron; 2 ♂, Klapmuts, 17.xii.1981, J. G. Theron; 6 ♂, Stellenbosch, 5.iii.1973, J. G. Theron; 1 ♂, 5 ♀, Helshoogte, Stellenbosch, 11.viii.1969, J. G. Theron; 1 ♂, Somerset West, 25.ix.1981, J. G. Theron; 4 ♂, Halfmanshof, 17.xii.1981, J. G. Theron; 2 ♂, Halfmanshof, 9.ii.1983, J. G. Theron; 3 ♂, Piketberg, 17.xii.1981, J. G. Theron; 4 ♂, Versfeld Pass, Piketberg, 17.xii.1981, G. Höppner; 1 ♂, Piekenierskloof, 19.i.1983, J. G. Theron; 3 ♂, Moorreesburg, 19.i.1983, J. G. Theron; 1 ♂, 3 ♀, Babylonstoren, Malmesbury, 7.v.1969, J. G. Theron; 4 ♂, Darling, 18.xii.1981, J. G. Theron; 4 ♂, near Mamre, 18.xii.1981, J. G. Theron.

REMARKS. This species has a wide distribution and has spread over the lower regions of the Witsenberg Mountain to the Agter-Witsenberg in Ceres. It is sometimes sympatric with *piquetia*.

Renosteria goudinica sp. nov., Figs 16–21

MALE. Length from apex of crown to tips of tegmina 3,44–3,80 mm; transocular width 1,08–1,20 mm; greatest width of pronotum 0,96–1,04 mm. Crown medially about as long as pronotum. Colouration similar to that of *R. waverena*.

Pygofer very short middorsally. Anal tube relatively broad. Pygofer lobe sharply triangular, with straight, acuminate, posteriorly directed process internally at apex (Fig. 19). Aedeagus small (Figs 16 & 17); shaft short and apex with small hook (in lateral view); dorsal apodeme of socle very short. Aedeagal appendages more than half length of shaft, thin and arising from socle; usually juxtaposed but sometimes arranged one behind the other. Gonopore large. Connective as in Fig. 20 and style as in Fig. 18.

FEMALE. Length 3,64–3,90 mm; transocular width 1,16–1,24 mm; greatest width of pronotum 0,98–1,08 mm. Crown usually slightly longer than pronotum. Seventh abdominal sternite as in Fig. 21.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Goudini Spa, Rawsonville, 10.iv.1974, J. G. Theron. Paratypes: 8 ♂, 2 ♀, same data as holotype; 7 ♂, 1 ♀, Botha Station, 2.xii.1981, J. G. Theron; 4 ♂, Worcester, ii.1929, i.1929, 27–30.iii.1921, ix.1928, R. E. Turner; 4 ♂, 1 ♀, Brandvlei, Worcester, 14.ii.1969, J. G. Theron; 19 ♂, 5 ♀, Robertson, 31.iii.1973, J. G. Theron; 5 ♂, 1 ♀, Bonnievale, 1.iv.1973, J. G. Theron; 2 ♂, 1 ♀, Bontebok Park, Swellendam, 11–26.xii.1973, J. G. Theron; 8 ♂, 4 ♀, Heidelberg, C. P., 31.i.1980, J. G. Theron; 1 ♂, 1 ♀, Swellendam, 23.i.1982, J. G. Theron; 4 ♂, 2 ♀, 10 km W. Swellendam, 23.i.1982, J. G. Theron; 4 ♂, 5 km E. Villiersdorp, 28.x.1981, J. G. Theron.

Renosteria overbergia sp. nov., Figs 22–27

MALE. Length from apex of crown to tips of tegmina 3,36–4,18 mm; transocular width 1,06–1,20 mm; greatest width of pronotum 0,96–1,12 mm. Crown medially about as long as pronotum. Colouration fairly variable, but generally as in *R. waverena*. Pygofer short middorsally. Pygofer lobe rounded behind, with large slightly curved, postero-ventrally directed process (Fig. 24). Aedeagus usually with fairly thin appendages, arising from base of shaft (Figs 22, 23), slightly divergent proximally, but their apices twisted and crossed or contiguous; apex of shaft with small flanges (Fig. 23); dorsal apodeme of socle large, but somewhat variable in length. Connective as in Fig. 26. Style as in Fig. 25. Plates much longer than pygofer lobes.

FEMALE. Length 3,68–4,04 mm; transocular width 1,08–1,20 mm; greatest width of pronotum 1,00–1,08 mm. Hind margin of seventh abdominal sternite with deep medial incision (Fig.27)

MATERIAL EXAMINED SOUTH AFRICA: Holotype, ♂ Bredasdorp, 9.xii.1977, J. G. Theron. Paratypes: 13 ♂, 8 ♀, same data as holotype; 1 ♂, De Hoop, Bredasdorp, 9.xii.1977, J. G. Theron; 1 ♂, Caledon, 25.ix.1981, J. G. Theron; 5 ♂, 3 ♀, Baardskeerdersbos, 14.xii.1971, J. G. Theron; 1 ♂, Kleinmond, 23.xi.1977, J. G. Theron; 1 ♂, Villiersdorp, 28.x.1981, J. G. Theron; 5 ♂, Botrivier, 8.xii.1977, 25.ix.1981, J. G. Theron; 2 ♂, 2 ♀, Riversdale, 20.xii.1973, J. G. Theron; 14 ♂, Koo,

Rietvlei, Kruispad and Burgers Pass, Montagu, 18.i.1982, J. G. Theron; 1 ♂, Scheepersrus, Montagu, 3.vii.1973, J. G. Theron; 5 ♂, 2 ♀, Mossel Bay, 28.i.1980, J. G. Theron; 1 ♂, 20 km W. Mossel Bay, 23.i.1982, J. G. Theron.

REMARKS. This species is sometimes sympatric with *R. goudinica* and *R. montagua*.

Renosteria cangica sp. nov., Figs 28–32

MALE. Length from apex of crown to tips of tegmina 3,75–4,16 mm; transocular width 1,12–1,22 mm; greatest width of pronotum 0,98–1,08 mm. Crown medially about as long as pronotum. Head, pronotum and scutellum brownish. Costal area of tegmen opaque, milky; inner edge of claval region whitish, translucent; remainder of tegmen brownish, translucent.

Pygofer short middorsally; anal tube relatively long. Pygofer lobes as in *R. overbergia*. Shaft of aedeagus apically with two small, characteristic hooks (Fig. 29). Aedeagal appendages broad, arising from socle and diverging, but twisted apices contiguous (Fig. 28). Dorsal apodeme of socle large, about one-third length of shaft. Style and connective as in Figs 30 and 31. Plate as in *R. overbergia*.

FEMALE. Length 3,32–4,36 mm; transocular width 1,24–1,32 mm; greatest width of pronotum 1,06–1,18 mm. Seventh abdominal sternite (Fig. 32) resembling that of *R. overbergia*.

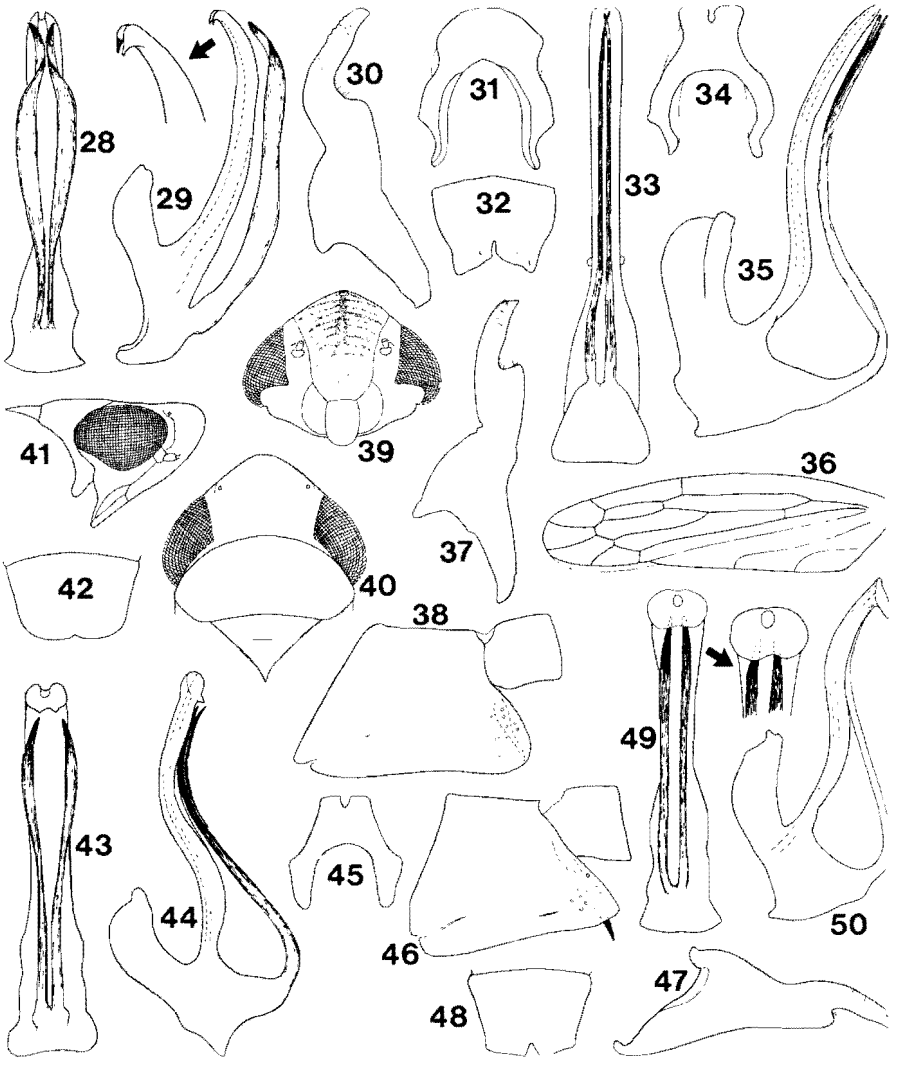
MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Holgate, Oudtshoorn, 30.i.1980, J. G. Theron. Paratypes: 2 ♂, 1 ♀, same data as holotype; 3 ♂, Holgate and 2 km E. Oudtshoorn, 20.i.1982, J. G. Theron; 3 ♂, 1 ♀, Kruisrivier and Cango, Oudtshoorn, 19.i.1982, J. G. Theron; 1 ♂, Cango Caves, 4.vii.1973, J. G. Theron; 3 ♂, near Robinson Pass, Oudtshoorn, 22.xii.1982, J. G. Theron; 4 ♂, De Rust, 23.i.1982, J. G. Theron; 1 ♂, 2 ♀, Meiringspoort, 29.i.1980, J. G. Theron; 6 ♂, 1 ♀, Camfer, 20.i.1982, J. G. Theron; 2 ♂, 2 ♀, Calitzdorp, 4.ii.1977, J. G. Theron; 1 ♂, 1 ♀, Huisrivier Pass, 19.i.1982, J. G. Theron; 7 ♂, 5 km E. and 10 km E. Ladismith, 19.i.1982, J. G. Theron; 6 ♂, Barrydale, 19.i.1982, J. G. Theron; 3 ♂, Barrydale, 3.vii.1973, J. G. Theron; 1 ♀, Willowmore, 22.i.1982, J. G. Theron; 6 ♂, 1 ♀, Matjesfontein, 6–15.x.1928, 1–18.xii.1928, 19–31.xii. 1928, R. E. Turner.

REMARKS. This species is close to *R. overbergia*, but can be recognized by the characteristic apical hooks of the aedeagal shaft. It is sometimes sympatric with *R. spadix*, *R. hoekoensis* and *R. karosella*.

Renosteria hoekoensis sp. nov., Figs 33–42, 74

MALE. Length from apex of crown to tips of tegmina 3,96–4,56 mm; transocular width 1,18–1,32 mm; greatest width of pronotum 1,12–1,04 mm. Colouration as in *R. ceresensis*. Head (Figs 39–41) distinctly dorsoventrally flattened. Crown medially sometimes slightly longer than pronotum and fairly sharply triangular in front. Disc of crown depressed.

Pygofer long middorsally; only shallowly incised by articular membrane of anal tube; tenth tergite strongly sclerotized and extensive (Fig. 38). Pygofer lobe



Figs 28–50. *Renosteria* spp. 28–32. *R. cangica* spec. nov. 28–31. ♂ Holotype. 28 & 29. Aedeagus, ventral and lateral views. 30. Style. 31. Connective. 32. Seventh abdominal sternite of ♀. 33–42. *R. hoekoensis* spec. nov. 33–41. ♂ Holotype. 33. Aedeagus, ventral view. 34. Connective. 35. Aedeagus, lateral view. 36. Tegmen. 37. Style. 38. Pygofer, lateral view. 39. Face. 40 & 41. Head and part of thorax, dorsal and lateral views. 42. Seventh abdominal sternite of ♀. 43–48. *R. karosella* spec. nov. 43–47. ♂ Holotype. 43 & 44. Aedeagus, ventral and lateral views. 45. Connective. 46. Pygofer, lateral view. 47. Style. 48. Seventh abdominal sternite of ♀. 49–50. *R. albanensis* spec. nov., ♂ holotype, aedeagus, ventral and lateral views, with apex of shaft enlarged.

obtusely angled posteroventrally and process relatively thin, fairly straight and sometimes not extending beyond ventral margin of lobe. Aedeagus very large (Figs 33 & 35); shaft dorsoventrally flattened (broadening slightly apically), with apical half slightly recurved and with small circular gonopore at apex. Aedeagal appendages long, thin, recurved apically and arising from lower part of socle, their extremities usually in intimate contact with apical half of shaft. Dorsal apodeme of socle broad, about one third length of shaft. Apophysis of style short, with two distinct teeth at apex (Fig. 37). Connective as in Fig. 34.

FEMALE. Length 4,04–4,32 mm; transocular width 1,20–1,28 mm; greatest width of pronotum 1,02–1,10 mm. Seventh abdominal sternite as in Fig. 42.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Ladismith, C. P., 21.iv.1973, J. G. Theron. Paratypes: 20 ♂, 8 ♀, same data as holotype; 4 ♂, 15 km S.W. and 5 km E. Ladismith, 19.i.1982, J. G. Theron; 2 ♂, 3 km W. Huisrivier Pass, 19.i.1982, J. G. Theron; 1 ♂, Calitzdorp, 4.ii.1977, J. G. Theron; 15 ♂, 4 ♀, Rooiberg Pass, Calitzdorp, 24.i.1983, J. G. Theron; 2 ♂, Oudtshoorn, 30.i.1980, J. G. Theron; 22 ♂, near Robinson Pass, Oudtshoorn, 23.i.1982, 22.xii.1982, J. G. Theron; 1 ♂, Barrydale, 19.i.1982, J. G. Theron; 2 ♂, W. Rooihoogte Pass, 18.i.1982, J. G. Theron; 3 ♂, Rietvlei and Burgers Pass, Montagu, 18.i.1982, J. G. Theron; 3 ♂, Matroosberg Station, 18.i.1982, J. G. Theron; 2 ♂, Bokrivier, Ceres, 18.i.1982, J. G. Theron.

REMARKS. In *R. hoekoensis* the aedeagus is generally relatively large. However, in specimens from the vicinity of the Robinson Pass, Oudtshoorn (Fig. 74) and the Rooiberg Pass, Calitzdorp, the aedeagus is smaller, the shaft (which is somewhat stouter) measuring 0,43–0,46 mm in length, compared with 0,54–0,56 mm in specimens from other localities. The species is sometimes sympatric with *R. cangica*.

Renosteria karosella sp. nov., Figs 43–48

MALE. Length from apex of crown to tips of tegmina 3,96–4,36 mm; transocular width 1,16–1,28 mm; greatest width of pronotum 1,02–1,14 mm. Colouration more or less as in *R. ceresensis*. Head as in *R. hoekoensis*.

Pygofer only shallowly incised middorsally by articular membrane of anal tube; tenth tergite as in *R. hoekoensis*. Pygofer lobe fairly sharply angled posteroventrally, with pygofer process long, thin and extending beyond ventral edges of lobe (Fig. 46). Shaft of aedeagus slightly recurved, broad, guttershaped, with apical half of appendages usually fitting in gutter; shaft apically with small flanges and vertical lip, which varies slightly in size and shape (Figs 43 & 44). Socle and aedeagal appendages otherwise as in *R. hoekoensis*. Apophysis of style short and stout (Fig. 47). Connective as in Fig. 45.

FEMALE. Length 3,88–4,20 mm; transocular width 1,20–1,24 mm; greatest width of pronotum 1,04–1,08 mm. Seventh abdominal sternite as in Fig. 48.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Holgate, Oudtshoorn, 30.i.1980, J. G. Theron. Paratypes: 11 ♂, 7 ♀, same data as holotype; 2 ♂, Holgate, Oudtshoorn, 20.i.1982, J. G. Theron; 3 ♂, Kruisrivier, Oudtshoorn, 19.i.1982, J. G.

Theron; 8 ♂, 2 km E. and 2 km W. Oudtshoorn, 20.i.1982, J. G. Theron; 4 ♂, Cango, Oudtshoorn, 19.i.1982, J. G. Theron; 2 ♂, 1 ♀, Cango Caves, Oudtshoorn, 4.vii.1973, J. G. Theron; 6 ♂, De Rust, 23.i.1982, J. G. Theron; 1 ♂, Camfer, 20.i.1982, J. G. Theron; 2 ♂, 2 ♀, Avontuur, 2.ii.1977, 20.i.1982, J. G. Theron; 5 ♂, 2 ♀, Misgund, 3.ii.1977, 20.i.1982, J. G. Theron; 2 ♂, 2 ♀, Joubertina, 20.i.1982, J. G. Theron; 7 ♂, Willowmore, 22.i.1982, J. G. Theron; 3 ♂, 3 ♀, Witkranspoort, Prince Albert, 4.vii.1973, J. G. Theron.

REMARKS. This species is close to *R. hoekoensis* but can be recognized by the shape of the aedeagus. It is usually sympatric with *R. cangica*.

Renosteria albanensis sp. nov., Figs 49–50

MALE. Length from apex of crown to tips of tegmina 3,92–4,08 mm; transocular width 1,20–1,26 mm; greatest width of pronotum 1,08–1,10 mm. Colouration as in *R. ceresensis*. Crown medially as long as pronotum. Basal arms of connective fairly widely separated. Pygofer, styles and plates as in *R. karosella*, but aedeagus different (Figs 49–50). Shaft also gutter-shaped, but broadening more markedly apically, where large, rounded, funnel-shaped extension encircles gonopore.

FEMALE. Length 4,02–4,16 mm; transocular width 1,24–1,30 mm; greatest width of pronotum 1,08–1,16 mm. Seventh abdominal sternite as in *R. karosella*.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Paterson, 25.ix.1979, J. G. Theron. Paratypes: 6 ♂, 4 ♀, same data as holotype; 16 ♂, 1 ♀, Alicedale, 21.i.1982, J. G. Theron.

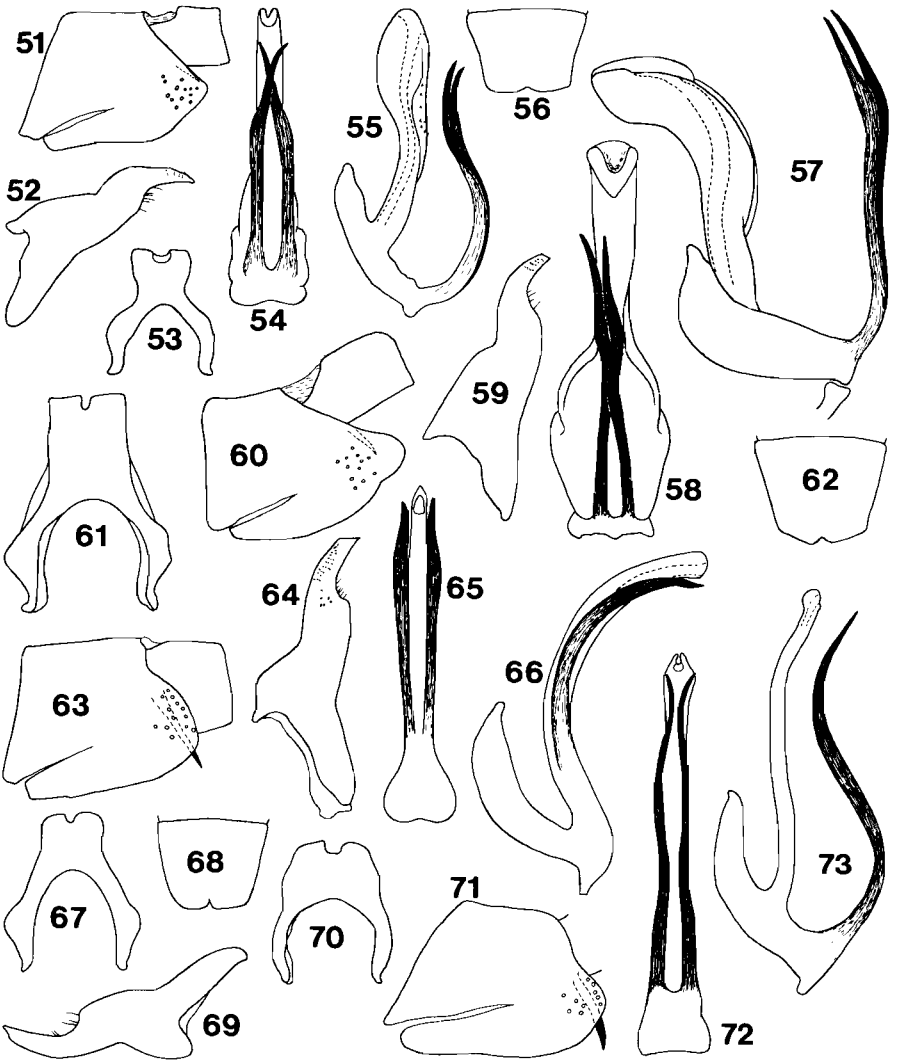
REMARKS. This is the eastern-most species of *Renosteria* and is close to *R. karosella*.

Renosteria hantamensis sp. nov., Figs 51–56 and 75–77

MALE. Length from apex of crown to tips of tegmina 3,64–4,04 mm; transocular width 1,12–1,24 mm; greatest width of pronotum 0,98–1,10 mm. Crown medially as long as pronotum. Colouration generally as in *R. ceresensis*, but showing much variation in specimens from Niewoudtville.

Pygofer long middorsally; tenth tergite as in *R. ceresensis*. Pygofer lobe angled posteriorly and pygofer process very short and poorly developed (Fig. 51). Shaft of aedeagus (Figs 54 & 55) fairly straight and clavate apically (less so in specimens from Nieuwoudtville); ventrally with median keel (sometimes bearing few minute teeth) and lateral flanges; gonopore large, apical. Aedeagal appendages arising from extreme ventral tip of socle, their apices crossed. Dorsal arm of socle about one third length of shaft. Apophysis of style short (Fig. 52). Connective as in Fig. 53, but in specimens from Niewoudtville with longer stem.

FEMALE. Length 3,68–3,92 mm; transocular width 1,16–1,24 mm; greatest width of pronotum 1,00–1,08 mm. Seventh abdominal sternite as in Fig. 56.



Figs 51–73. *Renosteria* spp. 51–56. *R. hantamensis* spec. nov. 51–55. ♂ Holotype. 51. Pygofer, lateral view. 52. Style. 53. Connective. 54–55. Aedeagus, ventral and lateral views. 56. Seventh abdominal sternite of ♀. 57–62. *R. cedarana* spec. nov. 57–61. ♂ Holotype. 57 & 58. Aedeagus, lateral and ventral views. 59. Style. 60. Pygofer, lateral view. 61. Connective. 62. Seventh abdominal sternite of ♀. 63–68. *R. piquetia* spec. nov. 63–67. ♂ Holotype. 63. Pygofer, lateral view. 64. Style. 65 & 66. Aedeagus, ventral and lateral views. 67. Connective. 68. Seventh abdominal sternite of ♀. 69–73. *R. montagua* spec. nov., ♂ holotype. 69. Style. 70. Connective. 71. Pygofer, lateral view. 72 & 73. Aedeagus, ventral and lateral views.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Calvinia, 2.ii.1978, J. G. Theron. Paratypes: 9 ♂, 5 ♀, same data as holotype; 23 ♂, 9 ♀, Niewoudtville, 1.ii.1978, J. G. Theron; 5 ♂, 7 ♀, 12 km and 15 km S. Garies, 20.i.1983, J. G. Theron; 19 ♂, 7 ♀, 15 km and 20 km S. Kamieskroon, 20.i.1983, J. G. Theron; 1 ♂, Calitzdorp, 4.ii.1977, J. G. Theron; 1 ♂, Oudtshoorn, 30.i.1980, J. G. Theron; 3 ♂, Barrydale, 19.i.1982, J. G. Theron.

REMARKS. In specimens from Garies and Kamieskroon the shaft of the aedeagus is more convoluted and the gonopore larger than in the holotype (Figs 75 & 76); they may represent separate subspecies. The same applies to a few specimens from Barrydale, Oudtshoorn and Calitzdorp, where the gonopore is also larger (Fig. 77) and the pygofer processes are well developed.

Renosteria cedarana sp. nov., Figs 57–62

MALE. Length from apex of crown to tips of tegmina 3,70–3,90 mm; transocular width 1,16–1,24 mm; greatest width of pronotum 1,00–1,08 mm. Crown medially as long as pronotum, fairly bluntly rounded in front. Colouration more or less as in *R. ceresensis*.

Pygofer lobe roundly angled posteriorly and pygofer process short and thin (Fig. 60). Aedeagus large (Fig. 57 & 58); shaft broad in lateral view, gutter-shaped, with lip below large gonopore. Socle with small dorsal apodeme, adpressed to shaft, and long thin aedeagal appendages arising from its extreme ventral tip. Apophysis of style short (Fig. 59). Connective exceptionally large (Fig. 61).

FEMALE. Length 3,75–4,02 mm; transocular width 1,22–1,28 mm; greatest width of pronotum 1,04–1,10 mm. Seventh abdominal sternite as in Fig. 62.

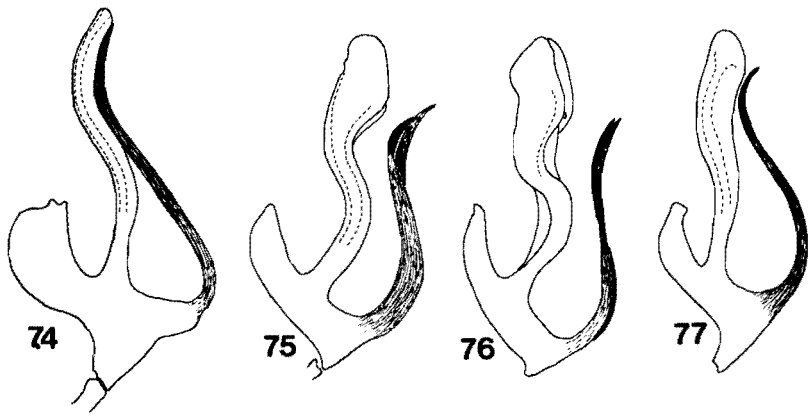
MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Cedar Mountains, Clanwilliam, 21.xii.1976, J. G. Theron. Paratypes: 6 ♂, 5 ♀, same data as holotype; 4 ♂, 1 ♀, near Katbakkies Pass, Ceres, 2.xii.1981, J. G. Theron; 5 ♂, 1 ♀, Grootrivier, Ceres, 2.xii.1981, J. G. Theron.

Renosteria piquetia sp. nov., Figs. 63–68

MALE. Length from apex of crown to tips of tegmina 3,58–4,00 mm; transocular width 1,12–1,22 mm; greatest width of pronotum 0,98–1,10 mm. Crown medially as long as or slightly longer than pronotum. Colouration variable, but usually as in *R. ceresensis*.

Pygofer long dorsomedially, with pygofer lobe broadly rounded behind; pygofer process long and straight (Fig. 63). Aedeagal appendages arising on basal part of strongly recurved shaft, to which they are closely applied (Figs 65 & 66). Shaft tubular, narrow with dorsal keel; gonopore at apex. Dorsal apodeme of socle long, about half length of shaft. Connective as in Fig. 67 and styles as in Fig. 64.

FEMALE. Length 3,60–3,82 mm; transocular width 1,12–1,20 mm; greatest width of pronotum 0,97–1,10 mm. Seventh abdominal sternite as in Fig. 68.



Figs 74–77. *Renosteria* spp., aedeagus, lateral view. 74. *R. hoekoensis* from near Robinson Pass, Oudtshoorn. 75. *R. hantamensis* from Garies. 76. *R. hantamensis* from Kamieskroon. 77. *R. hantamensis* from Barrydale.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Piketberg, 17.xii.1981, J. G. Theron. Paratypes: 2 ♂, 1 ♀, same data as holotype; 1 ♂, Piketberg, 26.x.1971, J. G. Theron; 14 ♂, 3 ♀, Versfeld Pass, Piketberg, 17.xii.1981, G. F. H. Höppner; 7 ♂, 5 ♀, Piekenierskloof, Piketberg, 19.i.1983, J. G. Theron; 16 ♂, 6 ♀, 15 km S. Clanwilliam, 19.i.1983, J. G. Theron.

REMARKS. This species is sympatric with *R. waverena* in the Piketberg region.

Renosteria montagua sp. nov., Figs 69–73

MALE. Length from apex of crown to tips of tegmina 3,80–3,94 mm; transocular width 1,12–1,24 mm; greatest width of pronotum 1,00–1,08 mm. Crown medially as long as pronotum. Colouration fairly uniformly yellowish-green.

Pygofer long dorsomedially, with pygofer lobe broadly rounded behind (Fig. 71); pygofer process long and straight. Aedeagal shaft long and thin in lateral view; slightly recurved near apex (Fig. 73). Socle slender and extremities of aedeagal appendages not in contact with shaft. Dorsal apodeme of socle narrow, about one third length of shaft. Style as in Fig. 69. Connective with short broad stem (Fig. 70).

FEMALE. Unknown.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♂, Montagu, 18.i.1982, J. G. Theron. Paratypes: 1 ♂, same data as holotype; 8 ♂, Kruispad, Rietvlei and Wildehond Pass, Montagu, 18.i.1982, J. G. Theron; 2 ♂, Scheepersrus, Montagu, 3.vii.1973, J. G. Theron.

REMARKS. This species is sympatric with *R. overbergia* and *R. hoekoensis*.

DISCUSSION

The structure of the aedeagus in *Renosteria* suggests that the species *R. spadix, R. montagua, R. waverena, R. ceresensis, R. overbergia* and *R. cangica* form a natural group; *R. hoekoensis, R. karosella* and *R. albanensis* form another species group. *R. cedarana* and *R. hantamensis* also represent allied species, but *R. goudinica* and *R. piquetia* occupy relatively isolated positions. All the species are strictly confined to *E. rhinocerotis* and perhaps its hybrids. The considerable number of species involved indicates that the dispersal of this plant has, at least in the southern Cape region, taken place a long time ago and is not due solely to the disturbance of normal plant relations and soil conditions by man in recent times. Steep mountain ranges and extensive sandy areas normally form barriers to the spread of the renosterbos and have also effectively prevented interbreeding between *Renosteria* populations isolated from one another by these physiographic features. The result is that new species evolved in the separated localities.

For this to have happened and especially for the geological events to have produced effective physical barriers, long periods of time must have elapsed. However, speciation by geographical isolation may have taken place through colonization, as described by Ross (1972), i.e. an occasional propagule may in some way (e.g. by air currents) cross a geographical barrier and become established in another area, as has often happened on oceanic islands. According to Stanley (1981) the process of speciation may proceed relatively rapidly (thousands of years) in such small insular populations of animals. At the present time the exact centres of origin of the various species are difficult to determine, but *R. ceresensis* certainly had its origin in the Ceres valley, *R. montagua* probably in the Montagu valley, *R. karosella* probably in the Oudtshoorn area and *R. piquetia* in the vicinity of the Piketberg mountains. Probably because of the subsequent spread of the host plant by various natural and human means and the consequent extension of the geographic range of the leafhopper species, some of the species are now sympatric.

Today it is generally agreed that frequent burning and overgrazing of the fynbos lead to a proliferation of renosterbos. Disturbance of the soil (which promotes establishment of renosterbos) through road-building operations, has also served to link up previously separated stands of the bush. Thus in parts of the Huisrivier Pass it is very noticeable that the renosterbos is confined to the old abandoned roadway.

In the early days the plant was often transported from place to place as firewood and Du Toit & Du Toit (1938) mention that it was used as packing material in the wagons of the early transport-riders; its seed could then be transported over long distances. I have found scattered renosterbos (devoid of leafhoppers) in the Royal Natal National Park. Patches of bushes also occur on the escarpment near Fouriesburg, O.F.S., but then lack their typical Cape cicadellid fauna and are inhabited by other leafhoppers, like *Coloborrhis corticina* Germar and a *Batracomorphus* species. In the Cape these leafhoppers never occur on renosterbos but feed on a variety of other plants. Long-distance transportation of seed obviously precludes colonization of the resultant new stands of the host plant by *Renosteria*. This can also be seen in the complete absence of *Renosteria* from renosterbos on Signal Hill and Camps Bay. The seeds were probably transported to these regions in the Cape Peninsula by man (or were windblown), but the leafhopper was unable to cross the extensive adjacent sandy area of the Cape Flats, where renosterbos does not grow. According to Smith (1966) tradition has it that the dispersal of the renosterbos in the Eastern Cape came about through the dumping of packing material in the Albany district by a wagon from the south-west.

However, this cannot be true as a different species of *Renosteria (R. albanensis)* has evolved in the Eastern Cape and dispersal of renosterbos to that region is therefore not a recent event.

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