

Notes on the taxonomy of *Rubus* in southern Africa

C. H. STIRTON*

ABSTRACT

The taxonomy of *Rubus* in South Africa is beset with problems. These include the introduction of extra-African species as ornamentals and crops, the apparent segregation of new forms and finally hybridization with indigenous species. These problems are compounded by poor and incomplete collecting of *Rubus* in South Africa, and by the difficulty of relating introduced taxa to the many and varied species, varieties and ecotypes occurring in other countries.

RÉSUMÉ

NOTES SUR LA TAXONOMIE DU RUBUS EN AFRIQUE AUSTRALE

La taxonomie du *Rubus* en Afrique du Sud est assiégée de problèmes. Ceux-ci incluent l'introduction d'espèces extra africaines comme plantes ornementales et de cultures, l'apparente ségrégation de nouvelles formes et finalement l'hybridation avec des espèces indigènes. Ces problèmes se compliquent par des collections incomplètes et pauvres de *Rubus* en Afrique du Sud et par la difficulté d'apparenter les taxa introduits aux espèces nombreuses et variées, aux variétés et aux écotypes des autres pays.

Prior to the cytogenetic studies of Gustafsson (1942, 1943) there had been only a few studies such as those of Sudre (1908–1913), Focke (1911–1914) and Bailey (1941), that had attempted to produce an overall taxonomy of *Rubus*. By 1913 there were already some 3 350 Latin names in existence, many of which were applied to primary hybrids or very localized varieties (Gustafsson, 1943). As Newton (1975) has suggested, this may have been due to the vague species concepts prevailing at that time or it may have resulted from parochial attitudes adopted towards plants of widespread distribution. Nevertheless, from the work done by Gustafsson and other geneticists, we now know that much of the morphological diversity was a result of natural hybridization, polyploidy and apomixis.

Pseudogamy, a process whereby heterozygous segregates and hybrid derivatives can be maintained in nature, has played a particularly important role in the development of many agamic complexes in *Rubus* (Grant, 1971). A batologist not only has to contend with these basic genetic difficulties, but also has to deal with considerable phenotypic plasticity (Beijerinck, 1953; Heslop-Harrison, 1963). It is little wonder then that this remarkable genus had defied taxonomists for over three centuries and that there is still no consensus on supraspecific categories.

The problems of *Rubus* taxonomy in South Africa are aggravated by the introduction and naturalization of exotic species, the apparent segregation of new forms in areas surrounding cultivated blackberries, the role of hybridization among local, as well as between local and exotic species, and finally by inadequate herbarium material.

Harvey (1862) recognized five species of *Rubus* in South Africa: *Rubus fruticosus*, *R. ludwigii*, *R. pinnatus*, *R. rigidus* and *R. rosaefolius*. The last overall revision was by C. E. Gustafsson (1933) who added a further six species: *R. adolfi-friederici*, *R. chrysocarpus*, *R. ecklonii*, *R. immixtus*, *R. intercurrens* and *R. transvaalensis*. Also mentioned by Gustafsson were two species of introduced brambles: *R. affinis* and *R. argutus*, of which only the former was noted as a naturalized weed. Not included in any of these

studies are the now naturalized weeds *R. niveus* Thunb. (Java bramble), *R. cuneifolius* Pursh (American bramble) and *R. phoenicolasius* Maxim. (wine berry).

It is often difficult to decide whether certain species are indigenous or introduced. A case in point is *R. immixtus* C. E. Gust. The type locality of this species is Hogsback in the eastern Cape, an area which has an extremely variable *Rubus* flora and well noted for its large number of naturalized European plants such as gorse (*Ulex europaeus*), roses (*Rosa* spp.) and hawthorns (*Crataegus*). It seems quite probable, therefore, that *R. immixtus* may be either a European species or a hybrid with *R. rigidus* Sm. in its ancestry.

Gustafsson (1933) only catalogues one hybrid, *R. affinis* × *rigidus*, in his account Rubi Africani. If correct, this is a hybrid between an indigenous species and an introduced extra African species. What of the role of hybridization among indigenous species? Harvey (1862), under his doubtful species, recorded that an Ecklon and Zeyher specimen was 'almost intermediate between *R. pinnatus* and *R. rigidus*'. Adamson & Salter (1950) state that *R. pinnatus* hybridizes freely with *R. fruticosus* in the Cape Peninsula area. Focke (1911) reported two hybrids: *R. plicatus* × *pinnatus* and *R. pinnatus* × *rigidus*. The tremendous variability of *R. rigidus* and *R. pinnatus* in South Africa may well be explained by their apparent ability to hybridize with other species. It is interesting to note that Amor & Miles (1975) could find no trace of hybridization having occurred in Victoria, Australia, although they did not preclude this as a future possibility once the introduced species had increased their ranges.

These preliminary observations suggest that a taxonomic revision of *Rubus* in South Africa is highly desirable, but such a study would obviously be a long-term project. Although many modern revisions of *Rubus* are based largely on cytological investigations, it is nevertheless still necessary, in many parts of the world, to rely on herbarium material. If this material is inadequate or incomplete then the task becomes very difficult. The importance of complete herbarium collections has been stressed by a number of workers (Amor & Miles, 1974; Beijerinck, 1953; Edees, 1959; Watson, 1958). My impression, after having seen much of the available herbarium mate-

* Botanical Research Institute, Department of Agriculture and Fisheries, Private Bag X101, Pretoria, 0001.

rial in South Africa, is that few collectors have been aware of what would constitute adequate pressed material for the naming of a specimen of *Rubus*. For this reason, and because so little material is available for study and because some areas are undercollected, I have outlined the four components which make up a useful herbarium voucher (see also Amor & Miles, 1974; Beijerinck, 1953) — this in the hope that it will encourage collectors to collect more material.

It is important to collect:

1. One 10 cm section, with leaves, selected from the middle of a first-year cane of vegetative growth (primocane). *Rubus* usually, but not always, flowers in the second season. The first season or primocanes are easily recognized by their lush and robust growth.
2. One 10 cm section, with leaves, from the middle of a flowering cane (floricane). This is necessary as in most species of *Rubus* in South Africa the floricanes differ markedly in shape, size, leaf-shape and number, and presence or absence of a white bloom.
3. A complete inflorescence with flowers, and fruits if these are available.
4. A few petals dried separately. The petals of some species, if not collected separately, become lost during drying as they abscise rapidly after collection.

This dried material should be accompanied by full descriptive notes. Of great taxonomic value are the colours of petals, young and old fruits, primocanes and floricanes. The relative length and colour of stamens and styles, as well as the relative lengths of calyx lobes and petals which are often very diagnostic. It should also be noted whether canes are erect, arching or looping. Looping canes may tip-root during the Autumn equinox. Odd forms or unusual plants should also be collected with a note to that effect. It is important to accurately record the localities of oddities, particularly if they are collected near blackberry orchards or in areas known to be heavily treated with herbicides, as these chemicals are known to cause chimeras and unusual phenotypes.

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UITTREKSEL

Die taksonomie van Rubus in Suid Afrika is omring van probleme. Dit sluit in die invoer van spesies van buite Afrika as sierplante en gewasse, die oënskynlike segregasie van nuwe vorms en uiteindelijke verbastering met inheemse spesies. Hierdie probleme word vererger deur swak en onvolledige versameling van Rubus in Suid Afrika en omdat dit moeilik is om die verwantskap tussen ingevoerde taksons en die vele en uiteenlopende spesies, variëteite en ekotipes wat in ander lande voorkom, te toon.

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