

## *Eustachys caribaea* and *E. paspaloides* (Gramineae)

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**Summary** : *Eustachys caribaea* (Spreng.) Herter is reduced to a subspecies of *E. paspaloides* (Vahl) Lanza & Mattei. The nomenclature of the taxa is discussed.

**Résumé** : *Eustachys caribaea* (Spreng.) Herter est considéré comme une sous-espèce de *E. paspaloides* (Vahl) Lanza & Mattei. La nomenclature de ce taxon est discutée.

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Among a loan to the Rijksherbarium of HOUTTUYN specimens from Geneva (G), the voucher for *Andropogon muticus sensu* HOUTTUYN (1782 : 579) was received. HOUTTUYN uses this binomial proposed by LINNAEUS (1763 : 1482) for a Cape plant, for a specimen he had also received from the Cape. The identity of LINNAEUS' specimen is presently unknown, that of HOUTTUYN turns out to be *Eustachys paspaloides* (Vahl) Lanza & Mattei. As this species is known under various names, an attempt is made to clarify its nomenclature. In this connection material of what in America is usually known as *Eustachys caribaea* (Spreng.) Herter (*Chloris caribaea* Spreng.) or *Eustachys bahiensis* (Steud.) Herter (*Chloris bahiensis* Steud.) is compared, while that of *Eustachys petraea* (Sw.) Desv. (*Chloris petraea* Sw.) also has been studied.

HOUTTUYN's *Natuurlyke Historie* is distantly related to the 12th and 13th editions of LINNAEUS' *Systema vegetabilium* (1767, 1774) to which copious remarks based on his own collections are added (See WIJNANDS & HENIGER, in press). Under *Andropogon muticum* (*A. muticus* L.) he discusses a specimen he has received from the Cape. In the legend to the corresponding plate XCIII, Fig. 3 ("Aanwyzing", unpagé) the name *Andropogon capense* appears and this constitutes the basis on which the binomial *Andropogon capensis* Houtt. has been attributed to him. There is no indication that the volume was published in parts (STAFLEU & COWAN, 1979 : 344) which means that the two names were proposed simultaneously by HOUTTUYN for the plant from the Cape. The interpretation that *A. capense* Houtt. would be a *nomen novum* for what the author accepted as *A. muticum* L. at an earlier stage can therefore be excluded.

In the text HOUTTUYN states : "To this species the Cape grass seems to have to be brought home (italics mine) of which I have given the portrayal in Fig. 3, on Plate 93. The same, nevertheless, has many more than three or four, yea up to nine spikes on the top of the culm, with patent florets secund on a long thin bone. The florets one could say to be unbearded in comparison to the other species, although the outer glume has a very small erect awnlet. The colour is somewhat brownish, the culm is terete, smooth and straight, nearly a foot long, partly clothed by the sheaths. I can perceive no pubescence on it. This species was, I believe, not yet depicted".

The specimen in G is a perfect match (in reverso) for this plate and was labeled by HOUTTUYN as “*Planta capensis*”, “*Andropogon muticum* L.” indicating that he accepted that name for it. I guess that the binomial *Andropogon capensis* which was indeed used by the author in the “Aanwyzing”, was formed inadvertently by using the epithet “*capense*” for a specimen of that provenance. The epithet, when used later, e.g. in *Chloris capensis* (Houtt.) Thell. (1912 : 289), independently proposed again by MERRILL (1938 : 317), or in *Eustachys capensis* (Houtt.) Chiov. (1951 : 115) is not validated. The identity of *Andropogon muticum* L. is unknown. There is no specimen in the Linnaean Herbarium (LINN), or elsewhere as far as I know.

WILLDENOW (1806 : 919) followed by others suggests that it might be a *Chloris*, while HACKEL (1889 : 651, 694) without any indication of doubt identifies it with *Chloris petraea* Thunb. However, LINNAEUS’ remark that the rachis is articulated is against this. In the following, I will outline the nomenclature of the species represented by the HOUTTUYN specimen.

Firstly, because of the ensuing confusion about the epithet, it must be noted that SWARTZ (1788 : 25) describes *Chloris petraea* from the West Indies. This is a species distinct from HOUTTUYN’s South African species.

Secondly, it must be realized that there is only a single species of *Eustachys* in Africa, so all references to African taxa refer to this.

VAHL (1791 : 21) is the first to distinguish it clearly when he describes *Cynosurus paspaloides*. THUNBERG (1794 : 20) gives the binomial *Chloris petraea* without any reference to previous literature but with a detailed description different from the one given by SWARTZ. WILLDENOW (1797 : 416) cites it as a synonym under *Cynosurus paspaloides* and considers the older *Chloris petraea* Sw. from the West Indies as an entirely different species (“*est longe alia planta*”). In 1806, however, he changes his mind, since he then gives *Chloris petraea* Sw. preference over *Cynosurus paspaloides* including both THUNBERG’s and SWARTZ’s “*petraea*”.

*Chloris petraea* Sw. is a quite different species and the confusion to where the epithet pertains is due to an exchange of specimens between THUNBERG and SWARTZ. It also explains the use of “*petraea*” by THUNBERG and it is possible that THUNBERG actually did not intend to describe a new species at all.

In the THUNBERG Herbarium (IDC microfiche 1036) there is a collection by SWARTZ from Jamaica (N<sup>o</sup> 23938) labeled *Chloris petraea* (2x) and *Cynosurus paspaloides* (1x), and a collection by THUNBERG himself from the Cape (N<sup>o</sup> 23939) labeled *Eustachys petraea*, *Cynosurus paspaloides*, and *Chloris petraea*. It seems, therefore, that THUNBERG knew of *Chloris petraea* Sw. and used that name for this specimen in his Prodrum. THUNBERG never directly gives the reference to SWARTZ but does so implicitly when he cites WILLDENOW (1806 : 919) under *Chloris petraea* in his *Flora capensis* (1813 : 409). Although I have only seen the microfiche of the Jamaican specimen in the THUNBERG Herbarium it seems to be *Eustachys petraea* (Sw.) Desv., while the Cape specimen can only be *Eustachys paspaloides* because of its provenance.

To complicate matters further, SWARTZ (1797 : 194) in turn gives THUNBERG’s and VAHL’s names in synonymy and many others follow him in that.

NEES (1829 : 418) cites both authors under *Eustachys petraea*, although THUNBERG with a question mark, and he remarks that he is not sure whether all synonyms belong to this taxon. I am quite convinced that he deals with the species in the original sense of SWARTZ, since he cites American specimens only, remarking that the African species might be distinct (“*diversa*”). The reference to a North American provenance appears to be based on Herbarium Willdenow 18611, which is labeled “*Chloris petraea*... Habitat in America borealis”.

Later, however, in his treatment of grasses in the *Plantae Ecklonianae* (1832 : 299) NEES identifies the species from the Cape with *Eustachys petraea*, noting that these plants hardly differ from the species in America. Consequently, in his *Florae Africae australioris* (1841 : 248) and the *Agrostographia capensis* (1853 : 248) (a verbatim reprint) he deals with the African species as *Eustachys petraea*, providing the same description as in his *Agrostologia brasiliensis* (1829 : 419) and stating that it is present in both South Africa and South America. I believe, that here (as WILLDENOW before) he goes wrong in uniting the two taxa. *Eustachys petraea* (Sw.) Desv. has never been collected in the Cape.

Nomenclature in this group of *Chloris* (*Eustachys*) in South America becomes more complex when SPRENGEL (1824 : 295) describes *Chloris caribaea* (mistakenly thinking it came from the Caribbean) and STEUDEL (1854 : 208) *Chloris bahiensis* from Bahia. As currently understood these two names are synonyms.

*Chloris caribaea* is transferred to *Eustachys* by HERTER (1940 : 147). In recent floras it is always treated as a species very closely allied to *Eustachys paspaloides*, but still as a different species (STAPF, 1900 : 643, *C. petraea* Thunb. versus *C. bahiensis* ; RENVOIZE, 1974 : 335).

In contrast, PARODI (1953 : 19, 30) in his study of the Argentine representatives comes to the conclusion that the African and American specimens would belong to the same species. However, he didn't see African material. For Argentine he distinguishes *Chloris capensis* (Houtt.) Thell. var. *bahiensis* (Steud.) Parodi and *C. capensis* var. *glabrescens* (Hack.) Parodi using the pubescence of the lemma as distinctive character. He thinks that one of his two varieties might be identical with the African form, but this is incorrect. He bases the taxa mainly on the length of the hairs of the fertile lemma, but this pubescence is too variable to be reliable for the distinction of taxa. I do find more stable characters to distinguish between the African and American specimens, but they do not justify a distinction of species. I therefore agree with PARODI's merger of the African and American taxa at the species level and regard them here as subspecies of *E. paspaloides*. It cannot be said whether we have here an instance of amphi-Atlantic disjunction, or an early introduction of one species in one continent followed by genetic drift causing the differences. HITCHCOCK (1951 : 552) and CHIPPINDALL (1955 : 194) mention *Chloris capensis* from South Africa as having been introduced in North America in recent times, but these plants could well stem from the long established population of what was regarded as *Chloris* (*Eustachys*) *caribaea* before. The species apparently is widespread in both continents now.

#### KEY TO THE SUBSPECIES

1. Upper glumes awn 0.4-1.0 mm long. Lemmas rounded on the back, rarely gibbous, apex rounded, usually entire, rarely emarginate, mucro in 50 % of specimens present, then 0.1-0.3 mm long. Anthers 0.4-0.6 mm long. South and Central America . . . . . 2. *Eustachys paspaloides* subsp. *caribaea*
- 1'. Upper glumes awn 0.5-1.5 mm long. Lemmas usually gibbous, less frequently evenly rounded, apex usually slightly emarginate, rarely entire, awn subapical, rarely absent or minute, usually 0.5-0.7(-1) mm long. Anthers 0.9-1.1 mm long. Africa . . . . . 1. *Eustachys paspaloides* subsp. *paspaloides*

1. **Eustachys paspaloides** (Vahl) Lanza & Mattei subsp. **paspaloides**

- Boll. Reale Orto Bot. Palermo 9 : 56 (1910).  
*Cynosurus paspaloides* VAHL, Symb. Bot. 2 (27) : 21 (1791). Type : Bülow s.n. in Herb. Vahl, S. Africa, Cape (holo-, C).  
*Chloris petraea* THUNB., Prodr. Fl. Cap. 1 : 20 (1794), non Sw. (1788). Type : Thunberg 23939, S. Africa (holo-, UPS ; IDC microfiche 1036).  
[*Andropogon capensis* HOUTT., Nat. Hist. 2, 13, (1782) Aanw. pl. (2), («capense»).  
— *Chloris capensis* (HOUTT.) THELL., Repert. Spec. Nov. Regni Veg. 10 : 289 (1912) ; MERR., J. Arnold Arbor 19 : 317 (1938).  
— *Eustachys capensis* (HOUTT.) CHIOV., Webbia 8 : 115 (1951). Voucher : Houttuyn s.n., S. Africa, Cape (G)].  
*Eustachys petraea* auct. non (Sw.) DESV. : NEES, Linnaea 7 : 299 (1832).

2. **Eustachys paspaloides** (Vahl) Lanza & Mattei subsp. **caribaea** (Spreng.) Nowack, *comb. nov.*

- Chloris caribaea* SPRENG., Syst. Veg. 1 : 295 (1824). Type : Bertero s.n., "Guadaloupe", but never found in the West Indies since (holo-, B ; US, fragm.).  
— *Eustachys caribaea* (SPRENG.) HERTER, Revista Sudamer. Bot. 6 : 147 (1940).  
*Chloris bahiensis* STEUD., Syn. 1 : 208 (1854). Type : Moricand 2442, Brazil, Bahia (P).  
— *Eustachys bahiensis* (STEUD.) HERTER, Fl. II. Ur. I : 85, fig. 339 (1941).  
— [*Chloris capensis* var. *bahiensis* (STEUD.) PARODI, Revista Argent. Agron. 20 : 26 (1953)].  
*Chloris bahiensis* STEUD. fa. *glabrescens* HACK., Repert. Spec. Nov. Regni Veg. 8 : 46 (1910). Type : Fiebrig 4575, N-Paraguay, Centurion (holo-, W ; iso-, L).  
— [*Chloris capensis* var. *glabrescens* (STEUD.) PARODI, Rev. Argent. Agron. 20 : 26 (1953)].

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