

## NOTES ON BOTHRIOCHLOA KUNTZE (GRAMINEAE: ANDROPOGONEAE) IN MALESIA

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### ABSTRACT

SUMADIJAYA, A. & VELDKAMP, J.F. 2009. Notes on *Bothriochloa* Kuntze (*Gramineae: Andropogoneae*) in Malesia. *Reinwardtia* 12(5): 415 – 417. — The note is preliminary part for studies of *Bothriochloa* Kuntze in Malesia. Special caution should be given to *Bothriochloa intermedia* (R. Br.) A. Camus, now *B. bladhii* (Retz.) S.T. Blake, because of the variation, synonyms, and natural hybridization to generic level.

**Keyword:** *Bothriochloa*, *Dichanthium*, *Capillipedium*, Malesia

### ABSTRAK

SUMADIJAYA, A. & J.F. VELDKAMP. 2009. Catatan pada *Bothriochloa* Kuntze (*Gramineae: Andropogoneae*) di Malesia. *Reinwardtia* 12(5): 415 – 417. — Tulisan ini mengenai studi awal *Bothriochloa* Kuntze di Malesia. Perhatian khusus diberikan kepada *Bothriochloa intermedia* (R. Br.) A. Camus, sekarang adalah *B. bladhii* (Retz.) S.T. Blake, karena beragamnya variasi, sinonim, serta terjadinya kawin silang di alam hingga tingkat marga.

**Kata Kunci:** *Bothriochloa*, *Dichanthium*, *Capillipedium*, Malesia

### INTRODUCTION

Trinius (1832) recognized *Andropogon* L. sect. *Amphilophis*. Hackel (1883) regarded it as subgenus, and Nash (1901) elevated it to the generic level: *Amphilophis* (Hack.) Nash. However, this is a taxonomic synonym of *Bothriochloa* Kuntze (1891). At present, there are about 30 (Chen & Phillips, 2006) to 35 (Phillips, 1995) species world wide. Thirty four (<http://www.kew.org/data/grasses-db/sppindex.htm>, accessed on 10 September 2008) species are recognised in GrassBase-The Online World Grass Flora (Clayton *et al.*), and are distributed worldwide in tropical and subtropical areas: 17 are accepted as native to the America, 13 native to Africa and Eurasia, and four native to Australia. Twenty-one species (the four additional ones are treated as species synonyms by Clayton *et al.*) are accepted as native to the Americas (Zuloaga *et al.*, 2003). They often occupy open or partly shaded places (McIvor & Howden, 1992).

Five, or perhaps six species have been recorded from Malesia (Jansen, MS.). Note that different authors may have used different names for the same species, making an account of the species most confusing!

There are some local floras or checklists:

Malay Peninsula and surrounding area: Ridley (1925) had 2 species in *Amphilophis* Nash: *A. glabra* (R. Br.) Stapf and *A. pertusa* (L.) Stapf. Gilliland (1971) mentioned these as *B. intermedia* (R. Br.) A. Camus, which has numerous forms, and *B. pertusa* (L.) A. Camus, respectively. The first species is the only one in Singapore according to Duistermaat (2005) who used the presently correct name, *B. bladhii* (Retz.) S.T. Blake.

Java and the Lesser Sunda Islands: Monod de Froideville (1968) mentioned three species: *B. glabra* (Roxb.) A. Camus subsp. *haenkei* (Presl) Henrard, *B. modesta* (Backer) Backer & Henrard, and *B. pertusa* in Java. From Timor, De Castro (1964) recorded *B. glabra* and *B. pertusa* (L.) A. Camus. *Bothriochloa bladhii* and *B. ewartiana* (Domin) C.E. Hubb. were later found there as well.

Borneo: Merrill (1917) reported *Andropogon intermedius* R. Br.

Philippines: Merrill (1923) mentioned *Andropogon intermedius*.

The island of New Guinea: Henty (1969) cited *B. intermedia*, *B. ischaemum* (L.) Keng, and *B. insculpta* (Hochst. ex A. Rich.) A. Camus.

The Australian *B. ewartiana* has been found in the Lesser Sunda Islands (Sumbawa, Timor), the Philippines (Luzon), and Papua New Guinea (Madang) are apparently new records for Malesia.

## DISCUSSION

*Bothriochloa bladonii* seems to occur about everywhere in the area. The plants are facultatively apomictic ([http://www.tropical-forages.info/key/Forages/Media/accessHtml/Bothriochloa\\_bladonii\\_subsp.\\_glabra.htm](http://www.tropical-forages.info/key/Forages/Media/accessHtml/Bothriochloa_bladonii_subsp._glabra.htm), accessed 1 December 2008), but Soreng (*pers. comm.* 2008) mentioned obligately apomictic due to all sterile anthers. Therefore populations actually are clones. As a whole the species is therefore very variable as is shown by its many synonyms (only basionyms alphabetically given here): *Andropogon intermedius*, *A. glaber* Roxb., *A. haenkei* Presl, *A. punctatus* Roxb., *Amphilophis glabra* var. *paupera* Stapf ex Ridl., and *Rhaphis stricta* Nees in Hooker. The taxon is widely distributed over Tropical Africa and Asia. It is found in sunny and slightly sheltered grasslands, *Imperata* fields, on limestone, along roadsides, in teak forests, and in dry riverbeds, from 0–900 m.

The former name *B. intermedia* (R. Br.) A. Camus was well-chosen, but the name *B. bladonii* has priority. Occasionally, in the tetraploid stage, it hybridises with other species of *Bothriochloa*, *Capillipedium* Stapf, and *Dichanthium* Willemet, e.g. *B. ewartiana*, *B. ischaemum*, *Capillipedium parviflorum* (R. Br.) Stapf, and *Dichanthium annulatum* (Forssk.) Stapf. The hybrids are genetically isolated from each other in the diploid and hexaploid stage. Celarier & Harlan (1955) therefore recognized *B. intermedia* complex (now *B. bladonii*), consisting of *B. caucasica* (Trin.) C. E. Hubb., *B. decipiens* (Hack.) C.E. Hubb., *B. intermedia* itself, *B. ischaemum*, *B. pertusa*, and *B. venusta* (Thwaites) A. Camus.

Because of hybridization and intermediacy, some have advocated merging *Capillipedium* into *Bothriochloa* (Ohwi, 1942). Others, De Wet & Harlan (1966) even included them in *Dichanthium*, but then Roberty (1960) recognized no less than 12 sections among which were *Dichanthium* sect. *Amphilophis* (Trin.) Roberty, *Dichanthium* sect. *Bothriochloa* (Kuntze) Roberty, and *Dichanthium* sect. *Dichanthium*.

*Bothriochloa ewartiana*, basionym *Andropogon ewartianus* Domin. The presence of this Australian species of *Bothriochloa* seems to be new record for Malesia and was only found (as far as known) in four locations, in coastal grassy

plains that apparently were not subjected to burning.

*Bothriochloa insculpta*, basionym *Andropogon insculptus* Hochst. ex A. Rich. It is tentatively included here as it was introduced from Africa in a trial in Papua New Guinea, and no specimens have been reported since.

*Bothriochloa ischaemum*, basionyms: *Andropogon ischaemum* L., *Andropogon ischaemum* var. *fallax* Hack. Its original distribution is from southern Europe to China. It occupies roadsides and disturbed areas, and used in erosion control and as forages. It was introduced in Malesia long ago: Central Java (*Koorders* 25277 $\beta$  on 1898), Timor (type of var. *fallax* and *Cinatti* 1962–52), New Guinea (Central Prov.).

*Bothriochloa modesta*, basionym: *Andropogon modestus* Backer. It occurs exclusively in East Java, Madura, and Bali. It exists on dry and sunny grassland, along roads, on cliffs, riverbeds up to 400 m, and is locally abundant.

*Bothriochloa pertusa*, basionym: *Holcus pertusus* L. It was originally distributed from South Africa to Burma (now Myanmar), and is introduced elsewhere. It is resistant to trampling, drought, and grazing.

Further research is obviously needed to define a clear delimitation of the Malesian taxa here included under *Bothriochloa*.

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