

## **Eminium jaegeri (Araceae), a new species from northwestern Iran**

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JOSEF BOGNER & PETER BOYCE

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### Abstract

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*Eminium jaegeri* from the Zagros Mts in the Bakhtiari province in northwestern Iran is described as a species new to science and illustrated. It belongs to the group with entire leaf blades but differs from all known species of this genus by the connate tube of the spathe and its flowering without leaves.

Additional key words: aroids, taxonomy, Zagros Mts

### Introduction

When Mr Michael Jaeger sent us colour photographs of an unknown tuberous aroid from northwestern Iran in 2006, we were puzzled as it appeared to combine characters from two different genera: (1) a connate tube of the lower spathe reminiscent of most *Biarum* species, and (2) the short and relatively thick appendix reminiscent of *Eminium*. Although all known *Eminium* species have a convolute tube of the spathe, the spadix of our plant clearly shows the typical characters of the genus *Eminium*: a long axis with usually scattered, thread-like sterile flowers between the female and male zone of the spadix and a unilocular ovary with two ovules (instead of one as in *Biarum*). Also molecular data (N. Cusimano, unpublished, pers. comm.) confirms the inclusion of our new species in the genus *Eminium*.

### *Eminium jaegeri* Bogner & P. C. Boyce, **sp. nov.**

Holotypus: Cultivated from tubers of the wild source “Iran, Provinz Bakhtiari, Zagros-Gebirge, Bazoft-Tal, Mavarz, Westseite des Kuh-Rang-Bergzuges, 1800 m, 32°09'N, 50°07'O, süd- bis südwestgeneigter Hang, Kalkfelsenuntergrund mit sehr steiniger Lehmauflage, vereinzelte Eichenbäume in der Nähe, keine weitere Begleitflora, da stark beweidet, 24.4.2004, *M. Jaeger JJMZ-67*”, flowering herbarium material prepared on 21.9.2005, *M. Jaeger 67a* (M).

Paratypus: Leaves prepared as herbarium material from the same cultivated source as the holotype, 11.3.2006, *M. Jaeger 67b* (M).

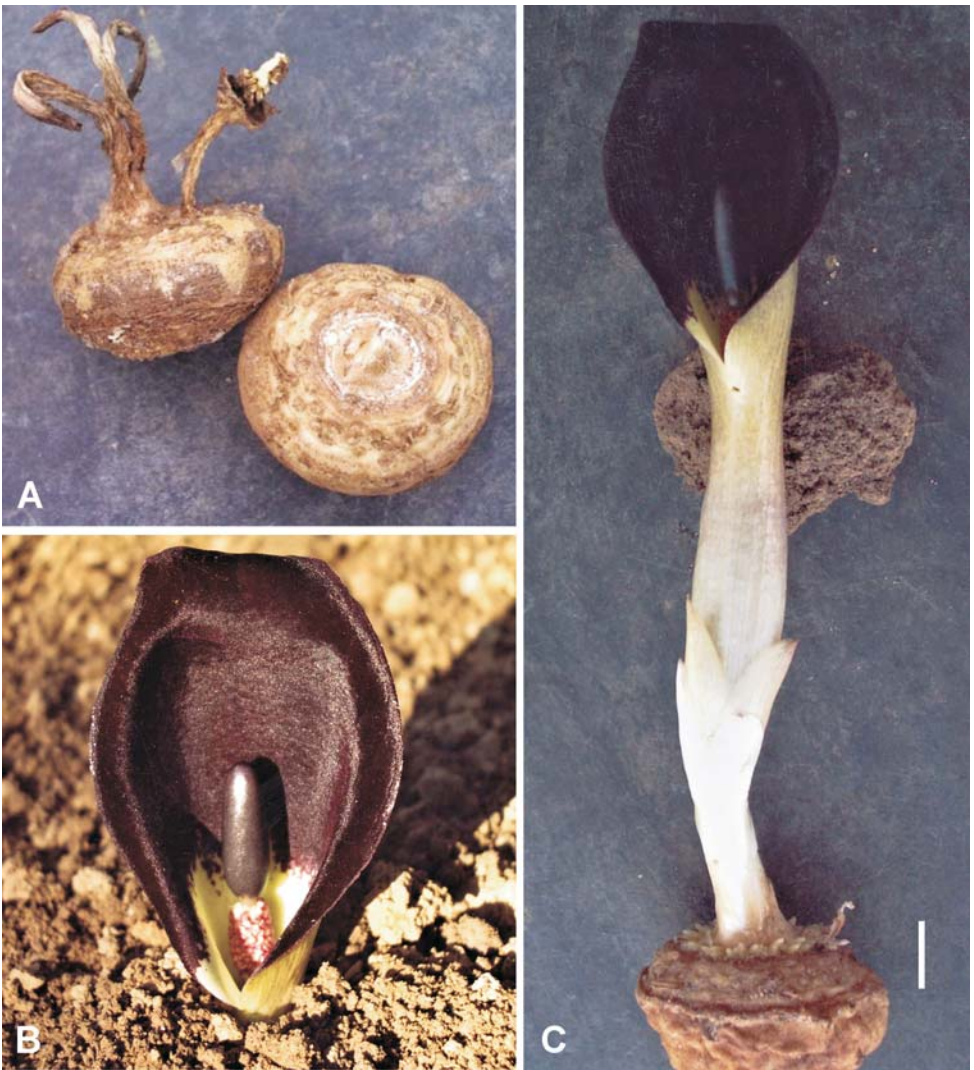


Fig. 1. *Eminium jaegeri* – A: two tubers, the left one with an infructescence; B: flowering plant in natural habitat, note the short appendix and the recurved apex of the spathe; C: flowering plant; it flowers without leaves. – Photographs of plants at the type locality by M. Jaeger.

Differt a speciebus omnibus adhuc notis tubo spathae connato et florens instatu non foliato.

*Herb* with dormant stage during the dry season, flowering from late September (in cultivation) or October (in nature) to November before the leaves appear; leaves lasting until April. *Tuber* (Fig. 1A) depressed-globose, 3-4 cm in diam. and 2-2.5 cm thick, light brown outside. *Leaves* (Fig. 2C) usually 3, up to 15 cm long; *petiole* 4-6(-7) cm long and 2-3 mm in diam., terete, somewhat flattened on the upper side of the distal part, mid green to dark green and somewhat reddish basally and whitish in the part below the soil surface, sheath short, 0.5-1.5 cm long; *leaf blade* entire, ovate, 4-7(-8) cm long and 1.5-3(-4) cm wide (the first leaf being the narrowest, 5-6 cm long and 1.5 cm wide), upper side of blade mid green to dark green or sometimes somewhat glaucous and glossy, base cordate to subauriculate or subsagittate, apex acute; *venation* reticulate, 4-5(-6) pri-



Fig. 2. *Eminium jaegeri* – A: flowering in cultivation, note the apex of the spathe still being erect; B: inflorescence, tube of spathe opened to show the sterile flowers between the female and male flowers; C: cultivated plant with leaves. – Photographs by M. Jaeger.



mary lateral veins on each side of the strong middle vein, forming a collective vein along the margin in a distance of (0.8-)1-1.5 mm, higher order veins thinner and between the primary ones. *Inflorescence* (Fig. 1C, 2A) solitary, subtended by 4 cataphylls, 1-5 cm long, the first being the shortest and the last one the longest, membranaceous, whitish to purple-red tinged (above the soil), apex acute. *Peduncle* short, c. 2 cm long, enclosed by the cataphylls, somewhat thickened below the inflorescence. *Spathe* (Fig. 1B-C, 2A-B) 11-13 cm long, lower part long-ovoid to subcylindric and margins completely connate into a tube, 5-6 cm long, below 1.5-1.7 cm in diam. and above c. 1-1.3 cm in diam., outside whitish (below soil) to purple-red and inside whitish in the upper third and purple in the lower two thirds; limb of spathe (5-)6-7 cm long and 3-4.5 cm wide, inside and outside deep purple,  $\pm$  smooth (to ? rough), first completely erect and later apex recurved; throat c. 1.3 cm wide, whitish, the transition between the purple limb and the whitish tube with some irregular purple spots. *Spadix* (Fig. 2B) 6.5-7.5 cm long, much shorter than spathe; *female zone* 1.2-1.4 cm long and 0.4-0.5 cm in diam.; *sterile zone* between female and male zone 3.5-4(-5) cm long and 1.5-2.5 mm thick, whitish, with very loosely spaced, sterile whitish flowers, these thread-like to slightly subulate and 2-5 mm long; *male zone* 0.8-1 cm long and 0.3-0.4 cm in diam.,  $\pm$  purple-red; *appendix* shortly stipitate, short and thick, subcylindric, 1.4-1.8 cm long and (0.3-)0.4-0.5 cm in diam., deep purple, smooth, apex blunt, stipe short, c. 2 mm long. *Flowers* unisexual, naked; *male flowers* densely arranged, thecae  $\pm$  round (in view from above), 0.4-0.5 mm in diam., purple-red, dehiscing by an apical slit, pollen yellow; *female flowers* densely arranged, ovary  $\pm$  roundish, c. 1.5 mm in diam., outside purplish and finely lighter punctate, unilocular, with 2 orthotropous ovules, stigma sessile, discoid to subhemispheric, 0.4-0.5 mm in diam., purple (dark coloured). *Berry* one-seeded (always?). *Seed* ovoid, 6 mm long and 4-5 mm in diam. at the broadest side, with strophiole, apex acute; *testa* rugose, dark brown; *embryo* elongate, straight, c. 3 mm long, undifferentiated; *endosperm* copious, pure white.

*Eponymy.* – *Eminium jaegeri* is named after its discoverer Mr Michael Jaeger, who grows this arid in the garden where it flowers regularly.

*Distribution and ecology.* – The species is so far only known from the type locality at 1800 m altitude on the western side of the Kuh range in the NW Iranian Zagros Mts (Bakhtiari province).

*Eminium jaegeri* grows in very stony loam over limestone on a sunny, southern to southwestern facing hillside, with scattered *Quercus* trees; the area is strongly grazed by livestock. The species flowers from October to November in the nature before the few leaves appear, which persist until April. Then the dormant period begins and continuous until October. The inflorescences have a carrion odour at anthesis. The infructescence is  $\pm$  subterraneous.

*Relationship.* – *Eminium jaegeri* is distinguished from all known species of the genus *Eminium* by the connate margins of the lower part of the spathe forming a tube (Fig. 1C, 2A) and by its flowering before the emergence of the leaves (Alpinar 2000, 2007; Engler 1920; Mayo & al. 1997; Mill 1984; Riedl 1963, 1969, 1980, 1985). It is most similar to *E. koenianum* Lobin & Boyce (1991) from northern Turkey, which has similar entire leaf blades, but with whitish patches, and an inflorescence appearing simultaneously with the few leaves in April. Furthermore the sterile zone between the female and male zone is more densely covered with subulate sterile flowers in *E. koenianum*. Other species of this genus with entire leaf blades are *E. regelii* Vved. from Central Asia, *E. lehmannii* (Bunge) Kuntze from Afghanistan, Central Asia and S Siberia and *E. heterophyllum* (Blume) Schott from N Turkey (Lobin & Boyce 1991), but the latter also produces divided leaf blades. Of the other entire-leaved species, *E. regelii* is a larger plant and has a long cylindrical appendix, the sterile flowers between the female and male zone of the spadix are densely arranged, and the limb of the spathe is longer. *E. lehmannii* has flattened sterile flowers between the female and male zone of the spadix, a longer and more slender appendix and the peduncle is distally not thickened. *E. jaegeri* has the waxy white powder between the cataphylls and on the shoot tip as it occurs in other species of this genus and in *Biarum* species as well as in *Ambrosina bassii* L.

*Biarum* and *Eminium* have both unilocular ovaries. *Biarum* has always one ovule in each ovary, whereas *Eminium* has two ovules, but the fruits are frequently one-seeded only. Mr Jaeger confirms that the berries of *E. jaegeri* were also one-seeded.

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