

Rediscovery of *Arisaema psittacus* (Araceae), a little known endemic and threatened species

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Abstract

Arisaema psittacus, a narrow endemic and threatened aroid species has been rediscovered from Mannavan Shola, one of its type localities, in the High Ranges of Idukki District of Kerala State, after it was first discovered by E. Barnes in 1937. A detailed description together with illustrations are provided to facilitate easy identification of this little known species.

The genus *Arisaema* C. Martius belongs to the subfamily Aroideae of Araceae and comprises about 150 species distributed from Central Africa and the Arabian Peninsula through the South and East Asia to North America and Mexico (Grayum, 1990). In India the genus is represented by about 40 species in two major centres of distribution : the Himalayas and the Western Ghats.

The Western Ghats harbour 17 species of *Arisaema*, of which 15 are reported to be confined to the area (Chatterjee, 1959; Sivadasan, 1985; Sivadasan & Sathish Kumar, 1987; Yadav *et al.*, 1993). Of these 15 endemics, 12 are confined mostly to the southern Western Ghats, where they occur in narrow isolated habitats especially in high altitude evergreen forests, sholas and grasslands of Nilgiris, Anamalai High Ranges and the Agastyar Hills. Some of these narrow endemic species are extremely rare while a few among them are known only from their original type collections made as far back as in 1930s. *Arisaema psittacus* is one such little known endemic species which was first described by E. Barnes in 1940, based on his own collections made in May 1937 from Chunduvurai and Mannavan Shola of the Munnar-Devikulam High Ranges in the southern Western Ghats of Kerala.

For many years since Barnes' original report, *A. psittacus* was not recorded either in its original habitat in the High Ranges, or elsewhere. This perhaps prompted Henry *et al.* (1979), Sivadasan (1983) and Ahmedullah & Nayar (1987) to categorize this as a species in danger of extinction while Shetty and Vivekananthan (1991) to presume it to be even extinct in its natural habitat. The conservation status of this taxon has been designated as 'Indeterminate' in the IUCN Threatened Plant List of 1986.

During a recent field survey carried out in connection with research project on

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'Conservation biology of endemic, rare and endangered species of *Arisaema* in the southern Western Ghats', the authors were able to rediscover *A. psittacus* in Mannavan Shola, its type locality, in May 1997, sixty years since its first discovery by E. Barnes in 1937. A small population comprising 71 flowering individuals of this species was located along the side of an un-tarred but jeepable road that traverses almost through the middle of Mannavan Shola. The road connects two hill stations viz., Mattupetty and Kanthalloor in the Munnar-Devicolam High Ranges. The species was found growing more in the exposed areas than the interior of sholas at higher elevations between 1840-2110.m from MSL.

The only sources of information available on the morphology and geographical distribution of the species are the original latin description provided by E. Barnes (1940) followed by a brief description in English by Chatterjee (1959). Therefore a more detailed description along with relevant illustrations are provided to help easy identification of this little known species.

Arisaema psittacus E. Barnes in W.J. Hooker, Icon. Pl. Ser. 5, 4: t. 3405. 1940; Chatterjee, Bull. Bot. Soc. Bengal 8 : 131. 1959. (Figs. 1 & 2).

Perennial, succulent, cormous herbs. Corms 2-6 cm diam., 0.7-3 cm thick, oblate or hemispherical, with roots arising from the upperside, the flesh white. Cataphylls 3, innermost up to 64 cm long, membranous, light green or greenish with greyish brown mottlings, sometimes rose-tinged, tip rounded, mucronulate. Leaf solitary; petiole 50-120 cm long, 1-6 cm diam. at base, 0.4-3 cm diam. at tip, light green or greenish with greyish-brown or purplish mottlings, basal half or more sheathing the peduncle; leaflets radiate, 7-13, sessile, 14-35 cm long, 3-8 cm broad, elliptic-lanceolate to obovate-oblongate, base narrowly cuneate, apex caudate - acuminate, dark green above, light green and glossy below; midrib prominently raised below, whitish and tinged with brown; primary nerves 25-30, arising at an angle of 45-55° from the midrib and uniting into an intramarginal nerve 2-5 mm below the erose margin. Peduncle of inflorescence 30-60 cm long, 0.5-1.5 cm diam, light green or light green with grey and purple streaks. Spathe 16-36 cm long with a narrowly funnel shaped convolute basal tubular portion of 6-13 cm long, a middle more or less hemispherical and hooded limb portion of 6-14 cm long, and a terminal gradually tapering tail portion of 4-9 cm long; the basal tube striped with green and white, rounded - triangular in cross section, the limb portion greenish with 5 translucent or semitranslucent white stripes converging towards the apex, the terminal tail greenish with purplish tinge, pendant or incurved with the tip pointing horizontally or upright. Spadix sessile, erect, 7-15 cm long, larger in females. Male spadix with floriferous part 2-3.5 cm; staminate flowers scattered, each represented by 3 or 4 purplish anthers borne on a short rosy-white column, the anther lobes suborbicular, dehiscent by apical transverse slits; neuters 0 or rarely a few present; appendix stout, greenish-yellow coloured, cylindrical for 3-5 cm long then slightly narrowed above the middle and dilating into a terminal ovoid or inflated light yellowish or creamy-white subwarty head of 2.5 cm long. Female spadix with floriferous part 2-5 cm long; pistillate flowers numerous,

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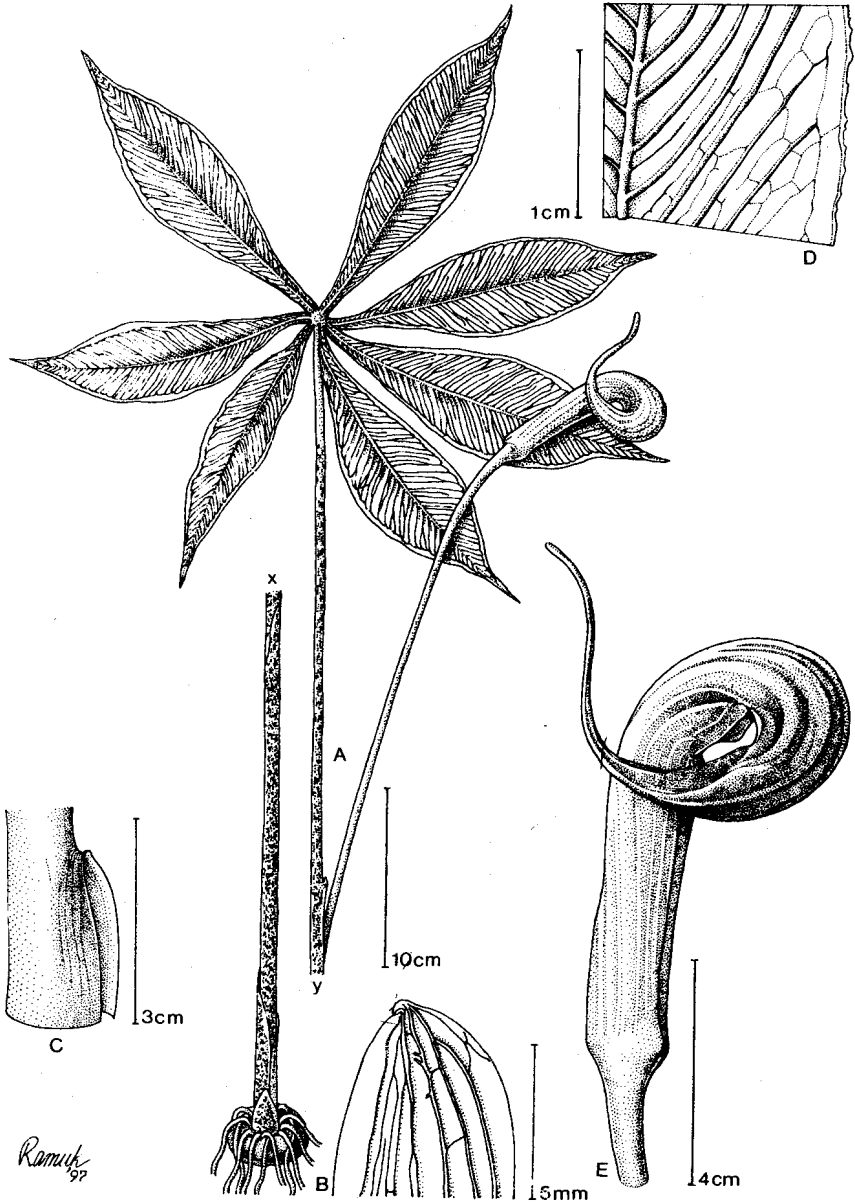


Fig. 1. *Arisaema psittacus* E. Barnes : A. Habit; B. Apex of cataphyll showing mucronulate tip; C. Mouth of petiolar sheath; D. A portion of leaflet showing venation; E. Inflorescence - side view.

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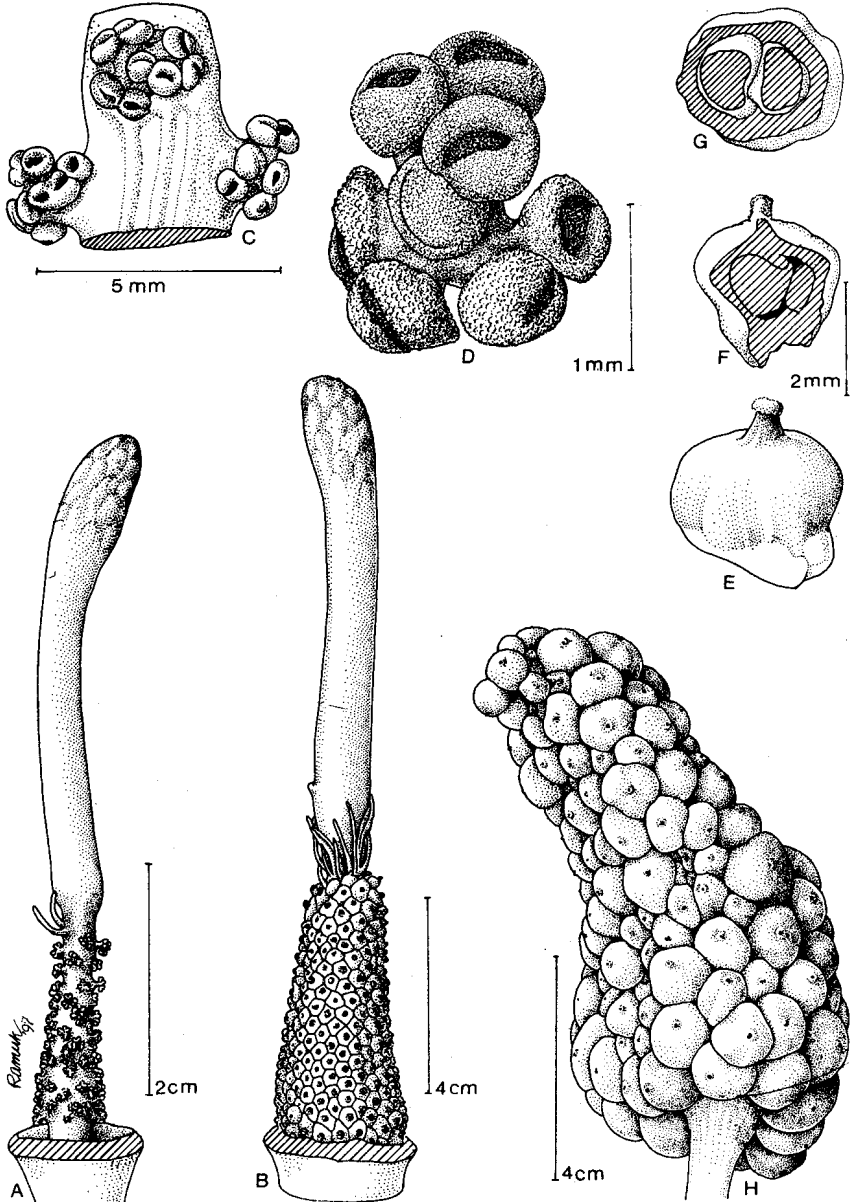


Fig. 2. *Arisaema psittacus* E. Barnes : A. Staminate spadix; B. Pistillate spadix; C. A portion of floriferous part showing groups of staminate flowers; D. A synandrium; E. A single pistillate flower; F. L.S. of pistillate flower; G. C.S. of ovary; H. Infructescence.

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compactly arranged; ovary green, ovoid, with 3-6 basal orthotropous ovules; style short, purplish; stigma white, peltate, papillose; neuters several, upcurved, up to 1 cm long, light green, and scattered above the pistillate flowers; spadix-appendix same as in males but larger. Infructescence 13.5 cm long, 5 cm broad at base, 3.5 cm broad at tip. Berries about 150 per infructescence, ca 2-4 cm diam., shining, orange to scarlet red when ripe. Seeds 3-6 per berry, 0.5-0.6 cm long, immersed in a mucilagenous pulp; testa bluish-black, translucent outside; albumen white.

Distribution: So far known only in Chundubarai and in Mannavan Shola of the High Ranges, Idukki Dist., Kerala State at altitudes between 1840-2110 m.

Flowering: May - June.

Fruiting: June-September.

Specimens examined: Mannavan shola, 2110 m, Idukki District, Kerala State, 25th May 1997, K.N. Nair, R. Jayakumar & R. Prathapachandran 31595 (male plant), 31594 (female spadix); *ibid.*, 24 Sept. 1997, R. Jayakumar 35910 (infructescence) [TBGT]; Shola on side of Chundubarai and Mannavan Shola, 2100-2250 m, May 1937, E. Barnes 1538, 1574, 1576, 1581, 1582, 1586, 1587 (K), 1579, 1580 (MH).

As in most other species of *Arisaema*, *A. psittacus* also exhibits a special type of dioecy, called 'paradioecy', in which female inflorescences are produced from larger corms and male inflorescences from smaller corms. The species can easily be recognised in the field by its peculiar greenish - white spathe. The spathe has a basal convolute tubular portion and an upper hooded recurved limb portion which is gradually narrowed into a long caudate greenish or purplish-green terminal tail. Barnes used the Latin epithet '*psittacus*' (*psittacinus* means parrot like) presumably in allusion to the characteristically hooded and recurved limb of spathe, which apparently resembles the head and beak of a parrot. The appendix of spadix is also characteristic which is cylindrical and greenish-white with an ovoid or subclavate light yellowish subwarty tip.

The size of plants was found varying depending upon their sex. Female plants were rather robust and larger compared to their male counter parts. Among the 71 flowering individuals examined, 66 were borne with staminate inflorescence and 5 with pistillate inflorescence. The above figures indicate a high male-female ratio i.e. 13:1, commonly noticed in other dioecious species of *Arisaema* also. Subsequent visits to '*A. psittacus*' site in Mannavan Shola in July and September 1997 yielded only a single female plant bearing a mature infructescence.

The highly restricted distribution, significantly low population size, and above all, the increasing threats to its natural habitat due to the renovation and expansion of the

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existing Kanthalloor - Mattupetty Road are factors that could adversely affect the survival of populations of *A. psittacus*. Suitable *in situ* conservation measures supplemented with adequate *ex situ* propagation and preservation techniques are therefore essential requisites for saving this narrow endemic species from the imminent threat of extinction.

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