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Short Communication

Taxonomic Notes on *Arisaema seppikoense* Kitam. (Araceae)

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Abstract. New localities of *Arisaema seppikoense* Kitam., a critically endangered and endemic species in central parts of Hyogo Prefecture, were recently discovered, and this species was morphologically re-examined. One plant with two foliage leaves was newly found. Male plant usually had less than seven leaflets. The length of pseudostem and peduncle in female plant were significantly longer than those of males. The spathe blade, spadix-appendage and anther showed the various combinations of color. *Arisaema seppikoense* does not seem to be so closely related to *A. cucullatum* M. Hotta based on the morphological and cytological differences examined.

Key words: Araceae, *Arisaema cucullatum*, *Arisaema seppikoense*, critically endangered species, endemic, Hyogo Prefecture

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Arisaema seppikoense was described by Kitamura (1949) based on only four specimens from Mt. Seppikosan, Yumesaki-cho, Shikama-gun, Hyogo Prefecture but his description did not discriminate between male and female plants. It was also recorded later from Mt. Kasagatayama Kanzaki-cho, Kanzaki-gun, Hyogo Pref. These two localities were close to each other and thus the distribution of this species seemed to be restricted to a small area of the central parts of Hyogo Pref. After those records, however, this species had not been found for a long time partly due to the excessive collections by amateures and the change of habitat conditions around there. Recently, several tens of living plants of this species, including both male and female plants, were re-discovered under the deciduous broad-leaved forests at the montane regions of 500-800 m alt. from Shikama-gun to Asako-gun, Hyogo Pref., and were able to be carefully examined morphologically and cytologically. As a result, it becomes necessary to emend the circumscription of dioecious *A. seppikoense*. In the present note, thus we will make a revised description of *A. seppikoense* and compare it on several characters with *A. cucullatum* M. Hotta which has been regarded to be the most closely related species (Hotta, 1963). Chromosome number, karyotype and the number of ovules per ovary were already reported (Watanabe *et al.*, 1998). Observation and measurements of several characteristics were made on the living plants in the field as well as on the herbarium specimens. Voucher specimens are deposited in the herbarium of Shoei Junior College (SHO). We would like to thank the curators of KYO, TNS and SHO for giving us the opportunity to study the herbarium specimens

in their care.

Morphological characteristics of Arisaema seppikoense

Pseudostem. The length of pseudostem was 1.5–11.8 cm (average 5.5 cm) in male plants and 12.7–31.5 cm (av. 24.7 cm) in females [17–24 cm in Kitamura (1949)]. The female pseudostem was significantly longer than that of male.

Foliation. This species usually has a single foliage leaf. During the two years observation, however, we found one female plant with two foliage leaves. It had nine leaflets in the first lower foliage leaf and seven in the second upper in 1996. Next year, it changed its gender to male but it had two foliage leaves again, showing eight leaflets in the first lower foliage leaf and six in the second upper (voucher specimen of *T. Kobayashi 30750*).

Petiole. The length of petiole is 11.0–20.5 cm (av. 16.0 cm) in male plants and 15.7–21.0 cm (av. 18.2 cm) in female [14–20 cm in Kitamura (1949)].

Leaflets. The number of leaflets was 5–7 (av. 6.4) in male plants and 7–9 (av. 7.8) in females [7–9 in Kitamura (1949)]. The number of leaflets in female is 1.4 times more than that in male. The length of leaflets was 10.0–16.5 cm (av. 12.9 cm) in male plants and 28.2–31.7cm (av. 30.0 cm) in females, and the width of leaflets was 2.1–3.7 cm (av. 2.8 cm) in males and 7.6–8.2 cm (av. 7.9 cm) in females. The length and the width of female leaflets was much longer and wider than those in male. It has been known that this species often had variegated leaflets. More than ninety percent of plants examined had the leaflets variegated with white.

Peduncle. The length of peduncle was 1.0–4.9 cm (av. 2.5 cm) in male plants [1–2 cm in Kitamura (1949)] and 7.8–10.7 cm (av. 9.1 cm) in females. Accompanying the change of its gender from male to female, the length of peduncle remarkably elongated.

Spathe. The length of spathe blade was 5.0–7.5 cm (av. 6.5 cm) and the length of the spathe tube was 4.2–5.5 cm (av. 4.7 cm) in male plants [spathe blade 7–8.5 cm, spathe tube 4–4.5 cm in Kitamura (1949)]. Measurements of the length of spathe blade and the length of the spathe tube for female plants have not been made yet. The color of spathe blade was various such as semi-scarious yellowish green, lightly greenish purple, purple, dark purple and blackish purple. Five scarious lines were distinct in the dark to blackish purple spathe blade.

Spadix-appendage. When the color of spathe blade was yellowish green, the color of spadix-appendage was always green. However, when the color of spathe blade was purplish, various color combinations of spadix-appendage were found, such as the the blackish brown appendage with the blackish green top, the green appendage with the blackish green top, and the lightly purple appendage with the blackish purple top [purplish in Kitamura (1949)].

Anther. The color of anther was various such as greenish white, purple, blackish green and blackish purple. However, it did not always correspond to the color of spathe blade. They showed various color combinations such as yellowish green spathe with purplish anther and dark purplish spathe with yellowish white anther.

Distinction between Arisaema seppikoense *and* A. cucullatum

Arisaema seppikoense has been regarded to be closely related to *A. cucullatum* known from Nara and Mie Prefectures in several vegetative

TABLE 1. Diagnostic characters of *Arisaema seppikoense* and *A. cucullatum*

	A. seppikoense	*A. cucullatum*
Chromosome number ($2n$)	26	28
Number of ovules per ovary (average)	12.5	8.9
Length of pseudostem (cm)	2−32	13−30
Number of foliage leaf	1−2	1
Length of petiole (cm)	11−21	15−20
Number of leaflet	5−9	7−13
Length of peduncle (cm)	1−11	1−7
Shape of spathe blade	Long acuminate, not cucullate	Curved cucullate
Colour of spathe blade	Yellowish green-dark purple-blackish purple	Yellowish green-dark purple

characteristics such as the number of foliage leaves, almost palmately pedate lamina, long petiolar vagina, short peduncle and middle leaflet usually shorter than the nearest lateral ones (Hotta, 1963). They, however, differ in chromosome number and the number of ovules per ovary (Watanabe *et al.*, 1998) as well as several other characteristics. Table 1 shows the diagnostic characters of the two species revised in this study. The length of pseudostem in male of *A. seppikoense* is occasionally less than 10 cm, whereas that of *A. cucullatum* is always more than 10 cm. The number of foliage leaves of *A. seppikoense* is occasionally two, however, that of *A. cucullatum* is always one. The number of leaflets in *A. seppikoense* is usually less than seven (5−9) but is usually more than ten (7−13) in *A. cucullatum*. *Arisaema seppikoense* differs from *A. cucullatum* in the color of spathe blade and spathe appendage as well as the shape of spathe blade. Based on these observations, the two species are distinct from one another and do not seem to be closely related as suspected previously.

References

Hotta, M. 1963. A new species of *Arisaema* from Japan. Acta Phytotax. Geobot. 19: 158−160.

Kitamura, S. 1949. Notes on Araceae of Japan. Acta Phytotax. Geobot. 14 : 5−8.

Watanabe, K., T. Kobayashi and J. Murata. 1998. Cytology and systematics in Japanese *Arisaema* (Araceae). J. Plant Res. 111: 509−521.

Appendix.

Herbarium specimens examined for *Arisaema seppikoense* Kitam.

Hyogo Pref.: Mt. Seppikosan, Yumesaki-cho, Shikama-gun (*S. Kitamura, s. n.* May 22, 1949, KYO-Holotype, TNS-Isotype; types designated by Ohashi and Murata in J. Fac. Sci. Univ. Tokyo, Sect. III, 12: 302 (1980), *S. Iwatani May 25, 1958* SHO), Yumesaki-cho, Shikama-gun (*T. Kobayashi 30750** SHO), Taka-gun (*T. Kobayashi 28933, 30748, 30749* SHO), Asako-gun (*T. Kobayashi 32931* SHO). *Specimen with two foliage leaves.

摘　　要

小林禧樹[1]・邑田仁[2]・渡邊邦秋[3]：セッピコテンナンショウ (サトイモ科) の再検討

セッピコテンナンショウは，わずか4個体の標本に基づき，雌雄株の区別がされないまま記載されていた。最近，新たにみつかった集団から，多数の個体で形質の測定が可能になったので，本種の再検討を行った。これまでの記載と異なり，葉が2個ある個体がはじめてみつかった。雄株では，雌株に比べて偽茎や花梗の長さがかなり短かく，小葉数が5枚になる個体もみられた。仏炎苞，附属体及び葯の色には黄緑～濃紫～黒紫色と大きな変異があり，それらの様々な組み合わせの個体がみられた。これまで近縁と考えられてきたホロテンナンショウとは，染色体数や胚珠数の違いのほか，形態上でも大きな違いがみられ，両種は近縁ではないことが示唆された。

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