オオチチッパベンケイの分類学上の位置について

メタデータ	言語: Japanese 出版者: 公開日: 2019-11-08 キーワード (Ja): キーワード (En): 作成者: 大場, 秀章, 天野, 誠, Ohba, Hideaki, Amano, Makoto メールアドレス: 所属:
URL	https://doi.org/10.24517/00055935

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J. Phytogeogr. & Taxon.
38: 1-5, 1990

Hideaki OHBA* and Makoto AMANO*: Notes on the Taxonomic Status of *Sedum oishii* OHWI (Crassulaceae)

大場秀章*・天野　誠*：オオチチッパベンケイの分類学上の位置について

Abstract

Sedum oishii OHWI is considered to be conspecific with *Hylotelephium sordidum* (MAXIM.) H. OHBA and treated as the variety.

Key Words: Chromosome number—*Hylotelephium*—*Sedum oishii*

The genus *Hylotelephium*, which is separated from the genus *Sedum* s. lato in having the ovaries with attenuate or stipitate base (OHBA, 1977, 1978), is specially diversified in the region from Central China to Japan through NE. China and Korea. *Hylotelephium*, however, has not been revised in species level. *Hylotelephium sordidum* along with its closely related species, named here as *H. sordidum* complex, is thought of as one of the taxonomically problematic groups.

MAXIMOWICZ (1883) described *sordidum* under the genus *Sedum* and cited the vol. 8t. 41 of "Somokuzusetsu" (as Soo bokf) by Yokusai (or Chojun) IINUMA and vol. 36 folia 3 and 4 of "Honzozufu" (as Phonzozoufou) by Kwanen (or Tunemasa) IWASAKI, and wrote that he saw the cultivated stock near Yedo (Tokyo) flowering in early October. The species apparently belongs to the genus *Hylotelephium* (OHBA, 1977).

MATSUMURA (1912) recorded this from Simidu (Aizu Prov.) in Honshu, Isidzutsi (Iyo) and Tosa in Shikoku, and Iwatake in Kyushu, though the latter three are of *H. viride* (MAKINO) H. OHBA. OHWI (1953) limited the range of *H. sordidum* to Honshu (Uzen, Echigo).

OHWI (1971) described a species named *Sedum oishii* related to *H. sordidum* from Mt. Amagoi, Fukushima Pref., N. Honshu. No further document on *S. oishii* has been published.

Cytologically SOEDA (1944), UHL and MORAN (1972), and FUNAMOTO and YUASA (1986a, 1986b) published chromosome numbers of *H. sordidum* as well as *H. viride* and *H. verticillatum*. Their result shows *H. sordidum* has 2n=24 which is the same to that of *H. viride* but differs from that of *H. verticillatum*, where a polyploid series (i.e. 2n=22, 48 and 92) is found.

The aim of the notes is to report the result of our observations on gross morphology and chromosomes and also discuss about the identity and taxonomic status of *S. oishii*.

Materials and methods

We observed and collected the materials identified as *Hylotelephium sordidum* and *Sedum oishii* throughout their ranges of distribution. Though *S. oishii* was known only the type locality, Mt. Amagoi, Fukushima Pref., we have found this at Mt. Namase-Fuji near Fukurodanotaki, Ibaraki Prefecture. When we examined the herbarium specimens of the concerned taxa, we have noticed its specimen collected there by H. SEKIMOTO in 1943. Some materials were transplanted to the Hongo campus of University of Tokyo, Tokyo. The root-tips from the cultivated materials were pretreated with 2 mM 8-hydroxyquinoline for 3 hrs. and fixed in FARMER's solution (ethanol: acetic acid=3: 1). Then they were stained with 2 % aceto-orcein for about 12 hrs. and squashed after maceration using 2 % pectinase. The voucher specimens were kept in TI.

Observation and discussion

The ovary of *S. oishii* is conspicuously stipitate as that of *Hylotelephium sordidum* and *H. viride* (Fig. 1). By this character *H. sordidum* complex

* Department of Botany, University Museum, University of Tokyo, Hongo 7-3-1, Tokyo 113.
〒113　文京区本郷7-3-1　東京大学総合研究資料館植物部門

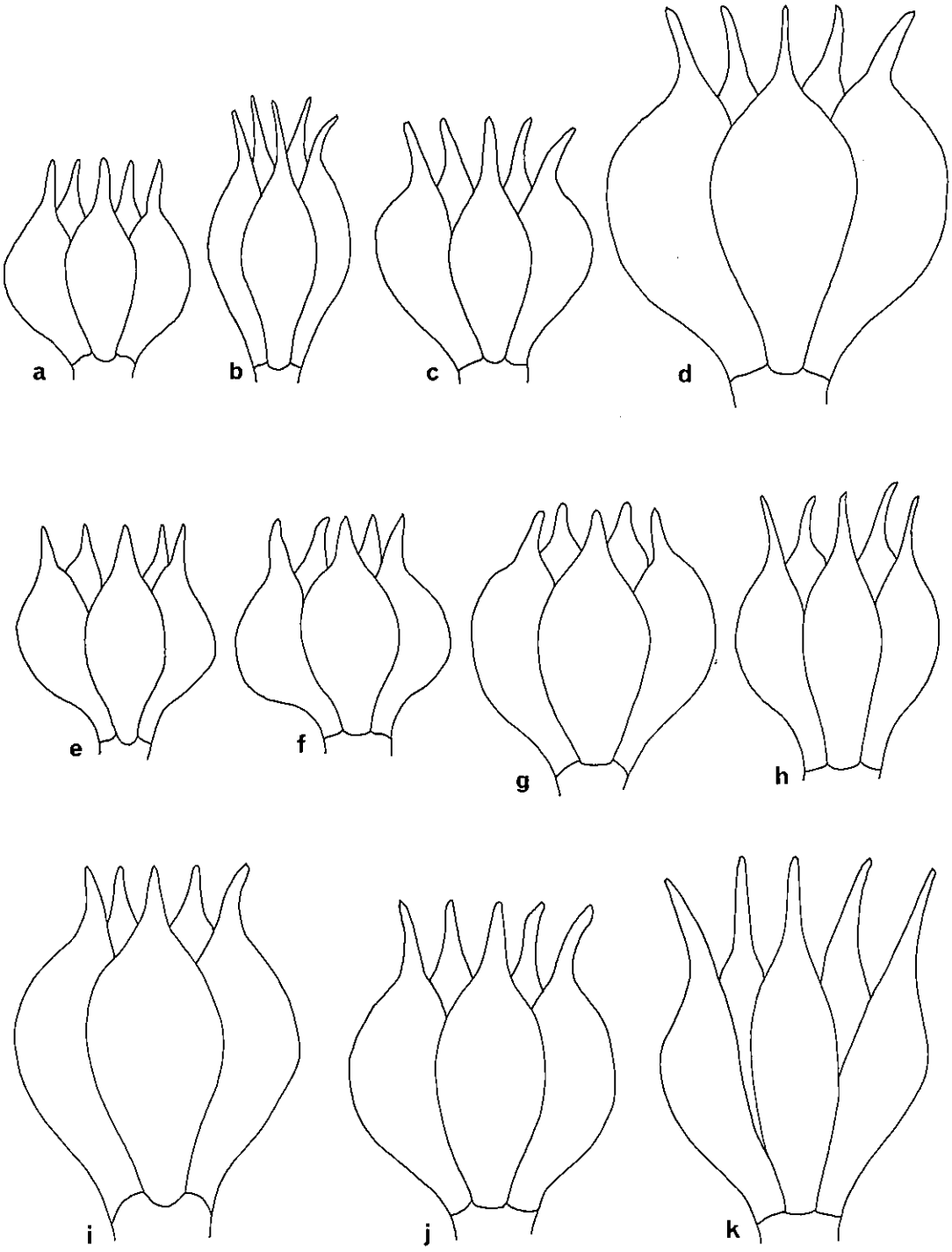

Fig. 1. Variation of ovaries of *Hylotelephium sordidum*, *H. viride* and *H. verticillatum*. a-d *H. sordidum* var. *sordidum*, e-f *H. sordidum* var. *oishii*, g-h *H. viride* and i-k *H. verticillatum*. [a: Takanosu-onsen, TOGASHI and YAMAZAKI, TI, b: Mt. Iide, TAMAKI, TI, c: Lake Towada, MURAMATSU on 15 Oct. 1933, cult. Akita in TI, d: Mt. Yahiko, ITO, TI, e: Mt. Amagoi, AMANO, TI, f: Mt. Amagoi, AMANO TI, g: Mt. Shiraiwa, YOSHIE, TI, h: Mt. Gomadan, OGAWA, TI, i: Nikko, YABE, TI, j: Beppu, ARAGANE, TI, k: Lake Furen, HARA and KUROSAWA, TI].

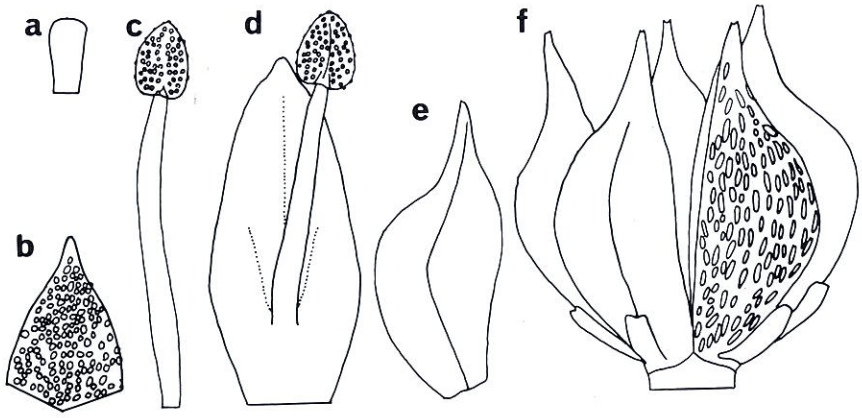

Fig. 2. Flower of *Hylotelephium sordidum* var. *oishii*. [Mt. Namase-Fuji, AMANO and MIDORIKAWA, TI]. a: Nectar scale, b: Calyx lobe, c: Stamen, d: Petal, e: Capel, f: Ovary.

is distinguished from *H. verticillatum* (L.) H. OHBA and its resembling species with ovaries having attenuate base.

S. oishii is similar to *H. sordidum* not only in the ovary characters but also in other floral and vegetative characters. OHWI (1971) pointed out the presence of papillae on the surface of the plant body, the green leaves and the longer petals as the differences of *S. oishii* from *H. sordidum*.

But, our materials of *S. oishii* have the green leaves with purplish colour, particularly on the lower surface and the margin, and the colour pattern never changes through several years. The petal length and its relative length to the anther share nearly the same ranges in both taxa. *S. oishii* always has dense papillae throughout the body including outer surfaces of calyx and overies (Fig. 2), only by this character *S. oishii* is distinguished from *H. sordidum*. On the other hand, *S. oishii*, obviously differs from *H. viride* by the alternate, broadly lanceolate to ovate or oblong-ovate leaves with crenate margins.

The chromosome numbers of *S. oishii* were probed 2n=24 to be by two plants from Mt. Amagoi (Fig. 3a), and 2n=22 by one from Mt. Namase-Fuji (Fig. 3b). The number of 2n=24 agrees with those of *H. sordidum* and *H. viride*, while the number of 2n=22 agrees with those of the diploids of *H. verticillatum* (FUNAMOTO and YUASA, 1986a, 1986b). The diploid number of 2n=22 is the first report in *H. sordidum* complex. Thus, *H. sordidum* complex has two different basic number. FUNAMOTO and YUASA (1986a)

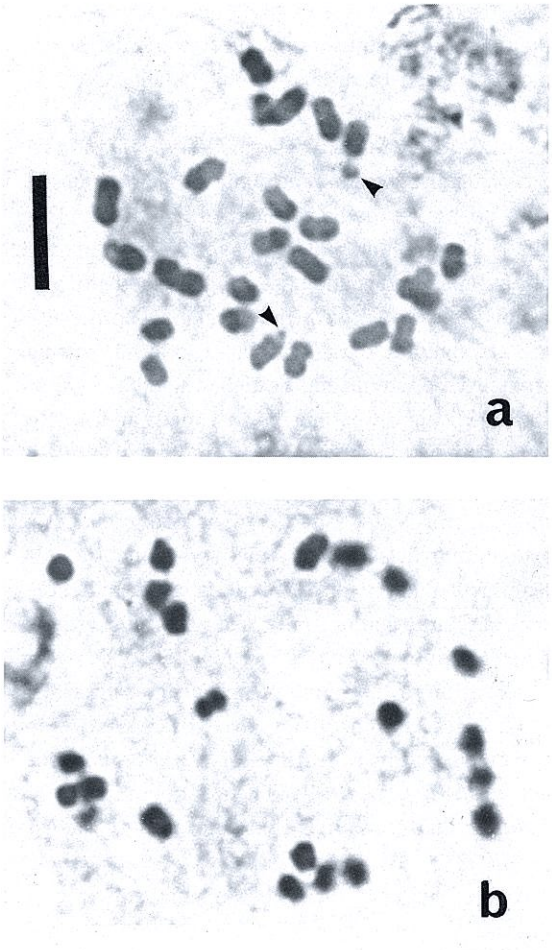

Fig. 3. Somatic chromosomes of *Hylotelephium sordidum* var. *oishii*. Bar indicates 5μ. Arrows indicate satellites a: Mt. Amagoi (2n=24); b: Mt. Namase-Fuji (2n=22).

reported the chromosome number, 2n=24, of the material collected at Mt. Amagoi, Date-gun, Fukushima Pref. as *S.* (=*Hylotelephium*) *sordidum*. It is thought of as *S. oishii* because *S. oishii* not *S. sordidum* was found at Mt. Amagoi.

Karyotype of the material from Mt. Amagoi is similar to that of *Sedum sordidum* MAXIM. illustrated by FUNAMOTO and YUASA (1986a), except for the size of satellite chromosomes. It is noted that the satellites are observed in short arm of the third (not second) shortest pair.

Taxonomic treatment

Sedum oishii differs from *Hylotelephium sordidum* only by the dense papillae throughout the body. Then, taxonomically these two are better to treat as the geographical varieties of a single species because of slight difference between them. Before considering the taxonomic treatment we need to discuss about which variety is the type of *Sedum sordidum* MAXIM.

MAXIMOWICZ (1883) described *S. sordidum* as a dirty purplish-green erect plant of one feet length with sparse, spreading, thick, orbicular or orbicular-obovate and entire leaves ending at the obtuse apex and round base which is suddenly and widely contracted with the petiole. The flowers are arranged in a terminal flat- and loose-corymb from axils of stems and branches, and have green short pedicels, spreading ovate, shortly and widely apiculate petals which are more than twice as longer as the ovate sepals, brown anthers, linear thick nectar-scales, and ovoid, spreading, basally attenuate ovaries with distinct styles about a half length of ovary itself. His description indicates that he made this not only from the illustrations appeared in the herbals cited but also his own observation of the living or herbarium materials.

The description given by MAXIMOWICZ is coincident with the features of *H. sordidum*, but not with *S. oishii* at all. Then, taxonomically *S. oishii* is better to treat as the variety of *H. sordidum*. As mentioned above, *S. oishii* is restricted in two localities in Fukushima and Ibaraki Prefectures, while *H. sordidum* is found northern Chubu District and Tohoku District but is interrupted from the range of *S. oishii*.

Hylotelephium sordidum (MAXIM.) H. OHBA var. **oishii** (OHWI) H. OHBA et M. AMANO, comb. et stat. nov.

Sedum oishii OHWI in Journ. Jap. Bot. **46**: 82 (1971). Type: Japan. Honshu; In saxis Mt. Amagoi, 353 m. s.m., Hobaramachi in Iwashiro (M. OISHI, [culta in Yokosuka] 30 Oct. 1970, TNS).

SPECIMENS EXAMINED

Hylotelephium sordidum var. *oishii*:

Pref. Fukushima. Date-gun, Hobara-machi, Mt. Amagoi (M. OISHI on Oct. 30 1970; cult. in Yokosuka, TNS-**type**; M. AMANO on 20 Oct. 1986, TI). **Pref. Ibaraki.** Mt. Namase-Fuji (H. SEKIMOTO on 10 Nov. 1943, TI; M. AMANO and K. MIDORIKAWA on 4 Nov. 1986, TI).

Hylotelephium sordidum var. *sordidum*:

Pref. Aomori. Lake Towada (S. MURAMATSU on 3 Aug. 1932, TI). **Pref. Iwate.** Noda-mura, Kuki (M. TAKAHASHI on 12 Aug. 1973, TI); Iwazumi-cho, Sawayama (M. TAKAHASHI on 24 Aug. 1973, TI); Iwaizumi-cho, Mt. Ureira (M. TAKAHASHI on 9 Aug. 1963, TI); Miyako-shi, Osawa (H. OHASHI on 2 Sept. 1962, TI); Mt. Horai (H. IWABUCHI on 24 Aug. 1956, TI). **Pref. Yamagata.** Mt. Iide (G. KOIDZUMI on 14 Aug. 1908, TI); Mt. Iide, Kairagi-zawa (T. YAMAZAKI on 4 Aug. 1943, TI); Iide Mountain Range, from Jizodake through Tanemaki, Onishi, Kitamatadake, to Iide Onsen, Iide Shrine (H. OHBA *et al.* on 6-9 Aug. 1973, 73103, TI); Oguni-machi (S. OKUYAMA on 10 Oct. 1946; cult. in Numazawa 72549-72550, TNS); Togo-cho, Numazawa (S. OKUYAMA on 10 Oct. 1946, 72548, TNS); Takasaki-mura, Shimoakuto (S. OKUYAMA on 27 Sept. 1945, 99191, TNS); Mt. Matsukura (S. OKUYAMA on 27 Sept. 1945, 99192, TNS). **Pref. Miyagi.** Mt. Homan (N. KONISHI on Oct. 1893, TNS). **Pref. Fukushima.** Mt. Iide (TAMAKI on 19 Aug. 1915, TI); Hinoemata-mura (T. SUZUKI on 10 Oct. 1934, KYO); Mt. Hiuchi (J. OHWI and M. TAGAWA on 12 Aug. 1935, KYO). **Pref. Niigata.** Mt. Yahiko (I. ITO on 4 Oct. 1956; cult. in Tokyo, TI); Iwafune-gun, Sekigawa-mura, Takanosu-onsen (M. TOGASHI and T. YAMAZAKI on 21 July 1965, TI); Kitauonuma-gun, Irihirose-mura, Oshirakawa alt. 400 m (T. YAMAZAKI on 8 Aug. 1962, TI); Higashikanbara-gun, Tsugawa-machi, Mt. Kirin (T. NAKAI and T. MARUMIYA on 7 Oct. 1950, 79683, TNS); Mt. Sennokura (Y. FUEKI in 1967, TNS); Shimizu-toge (T. MAKINO in Aug. 1888, TNS). **Pref. Nagano.** Shimotakai-gun,

Sakae-mura, Shimizugawara-Mitama (M. MIZUSHIMA on 1 July 1956, MAK); Chiisagata-gun, Sanada-machi, Sanada-Kakuma (C. OHKAWA on 3 Aug. 1964, TNS).

We thank Mr. Kenji MIDORIKAWA for his help in field survey. We also appreciate the curators of the herbaria of Kyoto University (KYO), National Science Museum, Tokyo (TNS), Makino Herbarium, Tokyo Metropolitan University (MAK), and University of Tokyo (TI) for permitting to observe specimens.

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摘　要

オオチチッパベンケイをチチッパベンケイの変種とした。オオチチッパベンケイは，1971年に大井次三郎によって福島県保原町雨乞山の標本により記載された種である。大井は，オオチチッパベンケイは植物体に乳頭状突起を密布し，葉が緑色となる点で，近縁種であるチチッパベンケイと異なると述べている。KYO, MAK, TI, TNS に所蔵されているチチッパベンケイの標本とオオチチッパベンケイのタイプ産地である雨乞山と茨城県大子町生瀬富士の2カ所で採集した材料を観察した結果，乳頭状突起を密布する以外の点では，チチッパベンケイとオオチチッパベンケイは区別できなかった。チチッパベンケイは，主に長野・新潟・山形・岩手・青森の山地と岩手県の海岸に分布し，オオチチッパベンケイは，阿武隈山地の上記2点のみに産し，地理的に隔離して分布している。またその染色体数は，雨乞山では2n=24で生瀬富士では2n=22であり，雨乞山の個体の染色体数は，報告されているチチッパベンケイの染色体数と一致し，生瀬富士の個体の染色体は，ミツバベンケイソウの2倍体の染色体数と一致する。

(Received December 14, 1989)

○　正宗厳敬　**日本の自生蘭**，写真と図　第6集　自己出版。平成2年4月10日発行。A4判，92頁。15,000円。

既刊の各集と同様，カラー写真と線画で編集されていて，本集に所載の種類はスルガラン，ホソバシュンラン，カヤバシュンラン，カンラン，ナギラン，アキザキナギラン，ソシンラン，ヤマガワホウサイ，ショウキラン，キバナショウキラン，アコウネッタイラン，ヤクシマネッタイラン，ボウラン，リュウキュウボウラン，オガサワラボウラン，タイワンボウラン，ヤクシマアカシュスラン，ツリシュスラン，アワチドリ，クロカミラン，アキザキヤツシロラン，トケンラン，ミヤマモジズリ，キヌラン，ムカゴソウ，ガンゼキラン，ヤマトキソウ，ヒメフタバラン，コウズエビネ，ヨウラクラン，クスクスヨウラクラン，カキラン，カゲロウランの33種である。私は発刊の度に思うことであるが，今回も本集を手にして，正宗先生には御高令にもかかわらず執筆を続けられているお姿に，敬服申し上げるばかりである。なお，益々御健勝でお過し遊ばされますよう，祈念申し上げます。