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Hiroshi Hoshi[1], Hiroyoshi Ohashi[2] and Jin Murata[3,*]: **Development and Growth of Axillary Buds in *Lysichiton camtschatcensis* (*Araceae*)**

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Summary: Development and growth of axillary buds on the rhizomes of *Lysichiton camtschatcensis* (L.) Schott (*Araceae*) were observed in Sendai and Nikko, Japan. It was confirmed that the axillary buds were formed at the axil of the first (lower) leaf of the diphyllous sympodial units and some of them eventually grew to produce satellite rhizomes. It is noteworthy that, as the results of the elongation of the internodes, the main rhizome and satellite smaller rhizomes are connected with slender stolons.

As reviewed by Ray (1987), shoot morphology and organization patterns of *Araceae* were examined and described for most genera by Irmish (1874), Engler (mainly 1877), and Engler and Krause (1908), but Rosendahl (1911) was the first to make even a single observation on the shoot organization of *Lysichiton* Schott. He correctly described the diphyllous sympodial growth pattern (Ray 1987) of *Lysichiton* as well as *Symplocarpus* Salisb. ex W.P.C.Barton. In these genera, the axillary bud of the second (i.e., upper) leaf of the renewal shoot always grows as the next renewal shoot terminated by an inflorescence and the axillary bud of the first (lower) leaf remains on the rhizome as a vegetative bud. Rosendahl (1911) noted that "in no case so far as has been possible to ascertain do they [vegetative buds] develop into lateral shoots". But the live stocks in the field consist of a group of shoots, which suggests vegetative reproduction by the branching of rhizome, as Murata (1997) and Fujita and Ejima (1997) described for *L. camtschatcensis* (L.) Schott. Although Rosendahl (1911) treated his material as *L. camtschatcensis*, Hultén and St. John (1931) confirmed it as *L. americanus* Hultén & H.St.John. Therefore it is significant to confirm vegetative reproduction by ramets originated from the axillary buds of the rhizome. Morphological observation was made on the live stocks of *L. camtschatcensis*.

The morphology and structure of *Lysichiton camtschatcensis*, especially the development and growth of the axillary buds, were examined based on mature individuals with a main rhizome 37–56 mm in diameter. In observation, all the roots are removed from the rhizome. Original observations were made regularly 12 times during April 1991 and May 1992 in Yoshinodaira, Sendai, Miyagi Pref., Japan and reported in the XV International Botanical Congress, Yokohama in 1993 (Hoshi and Ohashi 1993). Additional observations were made by Murata in October 2021 at the Botanical Garden, Nikko, The University of Tokyo, in Nikko, Tochigi Pref., Japan.

Fig. 1A shows an aggregate rootstock of *L. camtschatcensis* at flowering size, surrounded by many stout roots, which was dug up in November in Sendai. To observe the morphology and structure of the rhizome, all roots are removed (Fig. 1B). Fig. 1C shows another example dug

up in October in Nikko, from which roots are roughly removed. The upper white parts are the sheathing petioles of foliage leaves of the last summer, enclosing inflorescences and leaves that are accumulated to release in the coming spring and later. As Rosendhal (1911) described and illustrated, the rhizome is almost flat-topped and leaves and inflorescences accompanying two colorless scale leaves (α and β in Fig. 2A) are regularly arranged from the youngest in the center to the older ones outside (Fig. 2B). Fig. 2D shows an interpretation of the shoot organization for Fig. 2B. Axillary buds of the second (upper) leaf of the sympodial unit (= continuation shoot) always develop as the next continuation shoot (Fig. 2C). Axillary buds of the first (lower) leaf are dormant for some time, even after the subtending leaf is decayed, and some of them eventually grow to form satellite rhizomes at the top (Fig. 1C). It is most remarkable that, as the results of the elongation of the internodes, the main rhizome and satellite smaller rhizomes are connected with slender stolons (Fig. 1B). The stoloniferous nature was mentioned by Fujita and Ejima (1997) that "*L. camtschatcense*[*sis*] often extends a lateral bud from a rhizome which can develop into a fertile plant". As the main rhizome is deep underground and covered with stout roots tightly (Fig. 1A), the development of stolons may help to lift up the satellite rhizomes out of the roots to the shallow part of the soil.

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星 比呂志[1]，大橋広好[2]，邑田 仁[3]：**ミズバショウ（サトイモ科）の腋芽の成長による子苗形成**

ミズバショウ属の地下茎の構造はRosendahl (1911)によって詳しく調べられており，2葉継軸仮軸成長により形成されることが正しく観察されている．しかし，その観察は北米産のアメリカミズバショウ *Lysichiton americanus* Hultén & H.St.John に基づいており，アジア産のミズバショウ *L. camtschatcensis* (L.) Schott とは異なる可能性がある．また，2葉継軸の第1葉（下位の葉）の腋芽の動向については不明としている．そこで本研究では日本産のミズバショウについて，特に不明とされていた腋芽の成長を確かめ，その腋芽が成長する際にまず節間が長いストロンを形成し，その先に主根茎と同様の子根茎をつくることを明らかにした．主根茎は地下20–30 cmの泥中にあり，しかも太い根に密に覆われているので，ストロンにより子根茎を主根茎から離して持ち上げることにより，その葉が空中に出て光合成を行うことを助けているものと考えられる．

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