BOTANICHESKII ZHURNAL, 2022, Vol. 107, N 7, pp. 672–679

COMMUNICATIONS

GYNOECIUM STRUCTURE AND DEDELOPMENT IN *LEDEBOURIA SOCIALIS* AS A KEY TO UNDERSTANDING THE EVOLUTION OF SEPTAL NECTARIES IN ASPARAGALES

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DOI: 10.31857/S0006813622050064

The ovary of *Ledebouria socialis* is superior and bears interlocular septal nectaries running from a short gynophore up to the ovary roof. The nectariferous surfaces are located at the carpel stalk, ascidiate and plicate carpel zones. Despite the carpel zonation is clear, the gynoecial zonation can hardly be described using Leinferllner's terminology. The region of nectaries developed at carpel stalk and ascidiate zone is formed via congenital fusion exclusively and the nectariferous cavities are internalized *ab initio*. The distal region of the septal nectaries requires postgenital fusion to isolate the nectariferous cavities in the gynoecium centre. The internalization of the septal nectaries at the periphery is achieved due to receptacle outgrowth. The septal nectaries similar to those of *Ledebouria* are found in many Asparagales with superior ovary.

Keywords: gynoecium, zonation, development, morphogenesis, septal nectaries, Asparagales

ACKNOWLEDGEMENTS

The study was supported by a budgetary subsidy to the Lomonosov Moscow State University (Department of Higher Plants, Faculty of Biology, 121032500084-6).

REFERENCES

Baker J.G. 1870. Monograph of *Scilla*: Sections *Ledebouria* and *Drimiopsis*. – Saunders Refugium Botanicum. 3: 180–184.

Dyka O. 2011. Morphology and vascular anatomy of the flower *Ledebouria socialis* (Bak.) Jessop. (Hyacinthaceae). – Visnyk of the Lviv University. Series Biology. 56: 60–64 (In Ukranian).

Dyka O. 2013. Morphology and vascular anatomy of *Scilla bifolia* L. (Hyacinthaceae) flower. – Studia Biologica. 7: 123–130. https://doi.org/10.30970/sbi.0701.270

Fishchuk O. 2021. Comparative flower morphology in *Hippeastrum striatum* (Lam.) H.E. Moore (Amaryllidaceae). – Ukrainian Journal of Ecology. 11 (1): 273–278. https://doi.org/10.15421/2021_240

Fishchuk O., Odintsova A. 2021a. Comparative flower micromorphology and anatomy in *Hymenocallis spesiosa* and *Narcissus pseudonarcissus* (Amaryllidaceae). – Ukrainian Journal of Ecology. 11 (3): 178–187. https://doi.org/10.15421/2021_161

Fishchuk O., Odintsova A. 2021b. Micromorphology and anatomy of the flowers in *Clivia* spp. and *Scadoxus multiflorus* (Haemantheae, Amaryllidaceae). – Acta Agrobotanica. 74: article 7417. https://doi.org/10.5586/aa.7417

Gustafsson M.H.G., Albert V.A. 1999. Inferior ovaries and angiosperm diversification. – In: Molecular systematics and plant evolution. London. P. 403–431.

Hartl D., Severin I. 1981. Verwachsungen im Umfeld des Griffels bei *Allium*, *Cyanastrum* und *Heliconia* und den Monocotylen allgemein. – Beitr. Biol. Pflanzen. 55: 235–260.

Heel W.A., van. 1988. On the development of some gynoecia with septal nectaries. – Blumea. 36: 477–504.

Kocyan A., Endress P.K. 2001. Floral structure and development and systematic aspects of some "lower" Asparagales. – Plant Syst. Evol. 229: 187–216. https://doi.org/10.1007/s006060170011

Leinfellner W. 1950. Der Bauplan des synkarpen Gynözeums. – Österreichische Botanische Zeitschrift. 97: 403–436.

Leins P., Erbar C. 2010. Flower and Fruit. Morphology, ontogeny, phylogeny, function and ecology. Stuttgart. 439 p.

Odintsova A. 2013. Two principal models of monocots' septal nectaries. – Visnyk of the Lviv University. Series Biology. 61: 41–50 (In Ukranian).

Remizowa M.V., Sokoloff D.D., Rudall P.J. 2010. Evolutionary history of the monocot flower. – Annals of the Missouri Botanical Garden. 97: 617–645. https://doi.org/10.3417/2009142

Rudall P.J. 2002a. Homologies of inferior ovaries and septal nectaries in monocotyledons. – Int. J. Plant Sci. 163 (2): 261–276. https://doi.org/10.1086/338323

Rudall P.J. 2002b. Unique floral structures and iterative evolutionary themes in Asparagales: Insights from a morphological cladistic analysis. – Bot. Rev. 68: 488. https://doi.org/10.1663/0006-8101 (2002)068[0488:UFSAIE]2.0.CO;2

Rudall P.J., Manning J.C., Goldblatt P. 2003. Evolution of floral nectaries in Iridaceae. – Annals of the Missouri Botanical Garden. 90: 613–631. https://doi.org/10.2307/3298546

Sajo M.G., Rudall P.J., Prychid C.J. 2004. Floral anatomy of Bromeliaceae, with particular reference to the evolution of epigyny and septal nectarines in commelinid monocots. – Plant Syst. Evol. 247: 215–231.

Sattler R. 1973. Organogenesis of flowers. A photographic text-atlas. Toronto. 207 p.

Simpson M.G. 1998. Reversal in ovary position from inferior to superior in the Haemodoraceae: evidence from floral ontogeny. – Int. J. Plant Sci. 159: 466–479.

Smets E.F., Ronse Decraene L.-P., Caris P., Rudall P.J. 2000. Floral nectaries in Monocotyledons: distribution and evolution – In: Monocots: Systematics and Evolution. Melbourn: CSIRO. P. 230–240.

Zuraw B., Weryszko-Chmielewska E., Laskowska H., Pogroszewska E. 2009. The structure of septal nectaries and nectar presentation in the flowers of *Allium aflatunense* B. Fedtsch. – Acta Agrobotanica. 62 (2): 31–41.