# Oval Ludwigia (*Ludwigia ovalis*)

## Ecological Risk Screening Summary

**U.S. Fish and Wildlife Service, March 2022**
**Revised, June 2022**
**Web Version, 7/21/2022**

Organism Type: Plant
Overall Risk Assessment Category: Uncertain

Photo: Krzysztof Ziarnek, Kenraiz. Licensed under Creative Commons BY-SA 4.0. Available: https://commons.wikimedia.org/w/index.php?curid=98993934 (June 2022).

# 1 Native Range and Status in the United States

## Native Range

From Wagner et al. (2007):

"[…] from Japan, Korea, northern China, and Taiwan (Raven [1963])."

## Status in the United States

No records of *Ludwigia ovalis* introduction into the wild in the United States were found.

*Ludwigia ovalis* is readily available from U.S.-based aquarium retailers such as California-based Aquarium Plants Factory, Buce Plant, and Glass Aqua; Colorado-based Aqua Imports; Florida-based Tropical World Nursery; Indiana-based Aquatic Arts; and Texas-based Canton Aquatics. At these retailers, one bunch of *L. ovalis* is currently priced between $4.99 and $15.99 (Aqua Imports 2022; Aquarium Plants Factory 2022; Aquatic Arts 2022; Buce Plant 2022; Canton Aquatics 2022; Glass Aqua 2022; Tropical World Nursery 2022).

There are no known trade regulations for this species in the United States.

## Means of Introductions in the United States

No records of *Ludwigia ovalis* introduction into the wild in the United States were found.

## Remarks

From WFO (2022):

"Synonyms
*Ludwigia palustris var. ovalis* (Miq.) H. Lév."

Information for this report was sought using the accepted scientific name of *Ludwigia ovalis* as well as the synonym *Ludwigia palustris var. ovalis*.

From Liu et al. (2020):

"Ancestral area reconstruction supports a North American origin of *L. ovalis* whose current East Asian distribution reflects a relict of the Arcto-Tertiary Geoflora. […] *L. ovalis* must have originated in North America, dispersed to East Asia, possibly through the Bering land bridge (e.g., Li et al., 2015; Patiño et al., 2016; Wen et al., 2016), and subsequently become extinct in North America."

# 2 Biology and Ecology

## Taxonomic Hierarchy and Taxonomic Standing

According to WFO (2022), *Ludwigia ovalis* is the valid scientific name for this species.

From ITIS (2022):

Kingdom Plantae
  Subkingdom Viridiplantae
    Infrakingdom Streptophyta
      Superdivision Embryophyta
        Division Tracheophyta

Subdivision Spermatophytina
Class Magnoliopsida
Superorder Rosanae
Order Myrtales
Family Onagraceae
Genus *Ludwigia*

## Size, Weight, and Age Range

From eFloras (2022):

"[…] perennial […]"

"[…] 20-45 cm tall […]"

## Environment

From Aquasabi (2022):

"pH value 4 - 7
Temperature tolerance 10 - 28°C
Carbonate hardness 1 - 7°dKH
General hardness 0 - 30°dGH"

All of the above environmental conditions refer to an aquarium context.

From eFloras (2022):

"Moist places, especially on beds of lakes and ponds; 100-500 m."

## Climate

From Liu et al. (2020):

"The North Temperate haplostemonous (NTH) *Ludwigia* group, characterized by […] north-temperate distribution, includes 24 species […] ([…] Raven, 1963; Wagner et al., 2007)."

"*Ludwigia ovalis* is the only NTH *Ludwigia* not native to America."

## Distribution Outside the United States

### Native

From Wagner et al. (2007):

"[…] from Japan, Korea, northern China, and Taiwan (Raven [1963])."

### Introduced

No records of *Ludwigia ovalis* introduction into the wild outside the United States were found.

## Means of Introduction Outside the United States

No records of *Ludwigia ovalis* introduction into the wild outside the United States were found.

## Short Description

From Wagner et al. (2007):

"Perennial herbs; stems terete, creeping and rooting at nodes. Leaves alternate; blades with one inconspicuous submarginal vein. Flowers 4-merous; petals absent; stamens as many as sepals, pollen shed in monads. Capsules globose, with thin walls, irregularly dehiscent. Seeds pluriseriate and free, the raphe inflated, nearly equal in size to seed."

## Biology

From eFloras (2022):

" Fl[owering] Jul-Sep, fr[uiting] Jul-Oct."

From Raven and Tai (1979):

"As far as known, it [*Ludwigia ovalis*] is tetraploid."

## Human Uses

From Aquasabi (2022):

"Ludwiga ovalis [sic] is a rather new species in the aquarium hobby."

*Ludwigia ovalis* is readily available from aquarium retailers, both in the United States and internationally. U.S.-based retailers were found in California (Aquarium Plants Factory 2022; Buce Plant 2022; Glass Aqua 2022), Colorado (Aqua Imports 2022), Florida (Tropical World Nursery 2022), and Texas (Canton Aquatics 2022). Internationally, retailers were also found in Australia (AquaLabs 2022), Bangladesh (Hossain and Mohsin 2020), Canada (aquascaperoom 2022), India (Himadri Aquatics 2022), Indonesia (Indonesia Fish Exporter 2010), and Latvia (Aqua Plants 2022).

## Diseases

No information on diseases was found for *Ludwigia ovalis*.

## Threat to Humans

No information on threat to humans was found for *Ludwigia ovalis.*

# 3 Impacts of Introductions

No records of *Ludwigia ovalis* introduction into the wild were found, so no information is available on impacts of introduction.

# 4 History of Invasiveness

The history of invasiveness for *Ludwigia ovalis* is classified as No Known Nonnative Population. *L. ovalis* has not been reported as introduced or established outside of its native range. This species is present in the aquarium trade. Historical trade volume is unknown, but one source reports that the species is relatively new to the aquarium trade.

# 5 Global Distribution

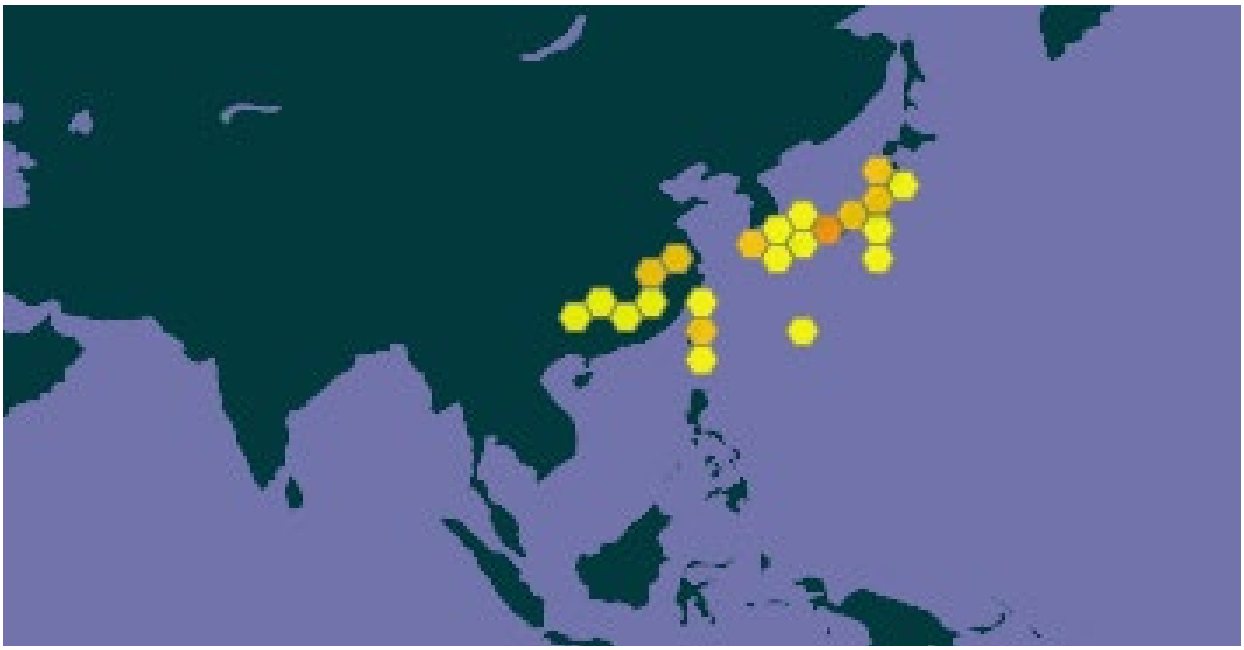

**Figure 1**. Known global distribution of *Ludwigia ovalis*. Observations are reported from East Asia. Map from GBIF Secretariat (2021).

Reported occurrences in Columbia, Ecuador, and Venezuela (GBIF Secretariat 2021) are not shown in figure 1 and were excluded from the climate matching analysis because these locations are not known to have established populations of *L. ovalis*.

# 6 Distribution Within the United States

*Ludwigia ovalis* has not been reported in the wild within the United States.

# 7 Climate Matching

## Summary of Climate Matching Analysis

The climate match for *Ludwigia ovalis* to the contiguous United States was highest in coastal North Carolina and South Carolina. The climate match was also high along other portions of the Atlantic coast from New York to Florida, all along the Gulf Coast, in scattered locations in the central Appalachian Mountains, and in a band stretching from northeastern Texas to southern

Iowa. The climate match was medium across much of the remainder of the eastern half of the country. Low climate matches were found nearly uniformly across the western contiguous United States and in coastal New England. The overall Climate 6 score (Sanders et al. 2021; 16 climate variables; Euclidean distance) for the contiguous United States was 0.305, high. (Scores greater than or equal to 0.103 are classified as high.) A majority of States had high individual Climate 6 scores. Massachusetts, Michigan, Minnesota, and New Hampshire had medium individual Climate 6 scores. Fifteen States had low individual Climate 6 scores: Arizona, California, Colorado, Idaho, Maine, Montana, North Dakota, New Mexico, Nevada, Oregon, Rhode Island, South Dakota, Utah, Washington, and Wyoming.

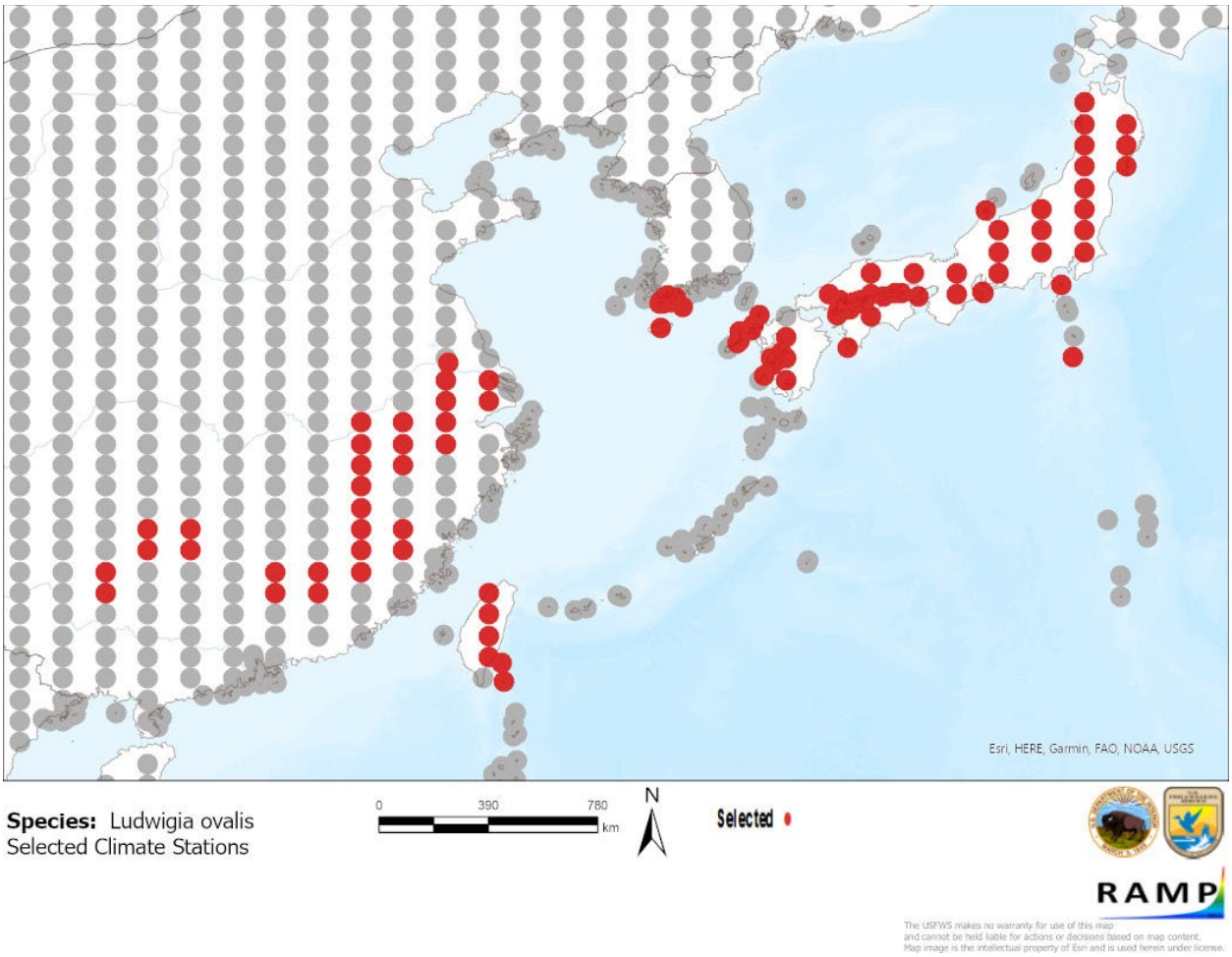


**Figure 2**. RAMP (Sanders et al. 2021) source map showing weather stations in East Asia selected as source locations (red; Japan, South Korea, China, Taiwan) and non-source locations (gray) for *Ludwigia ovalis* climate matching. Source locations from GBIF Secretariat (2021). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

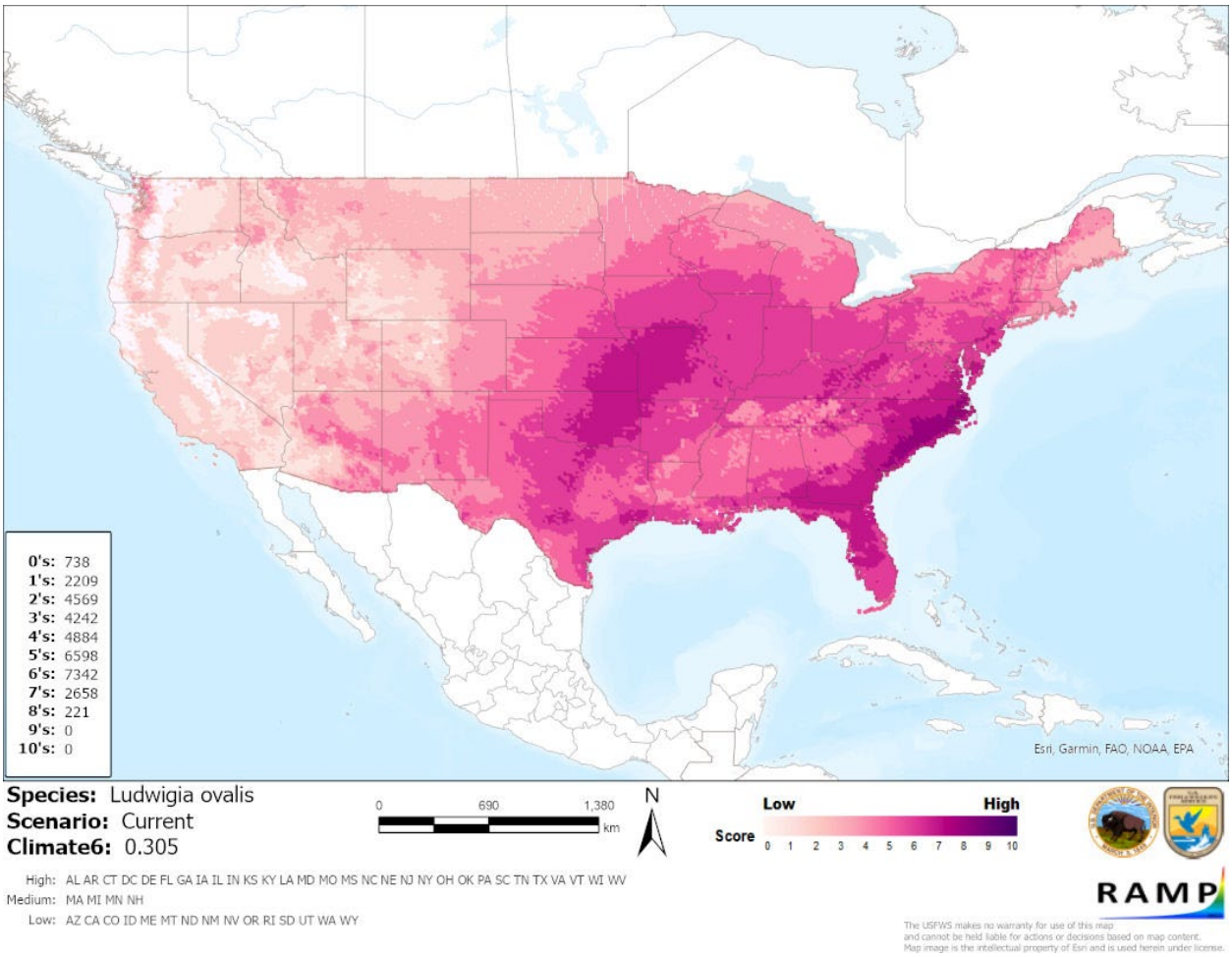


**Figure 3**. Map of RAMP (Sanders et al. 2021) climate matches for *Ludwigia ovalis* in the contiguous United States based on source locations reported by GBIF Secretariat (2021). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

| Climate 6:<br>(Count of target points with climate scores 6-10)/<br>(Count of all target points) | Overall Climate Match Category |
|---|---|
| 0.000≤X≤0.005 | Low |
| 0.005<X<0.103 | Medium |
| ≥0.103 | High |

# 8 Certainty of Assessment

The certainty of assessment for *Ludwigia ovalis* is low. There is limited information available in the English language literature on the biology, ecology, and distribution of *L. ovalis*. Much of the scientific literature on this species is not available in English, and therefore was not accessible in

the development of this report. No records of introduction or establishment outside the native range were found, so there is no information available on impacts of introduction of this species.

# 9 Risk Assessment

## Summary of Risk to the Contiguous United States

*Ludwigia ovalis* is a perennial plant that grows in lake and pond beds and is also used in the aquarium trade in the United States and abroad. The species is native to China, Taiwan, Japan, and the Korean Peninsula. Its history of invasiveness is classified as No Known Nonnative Population because of a lack of documented introductions into the wild outside the native range and limited data to characterize the volume and duration of trade in this species. The overall climate match with the contiguous United States is high; high matches were concentrated in the eastern and central contiguous United States while much of the land west of the Rocky Mountains had a low match. The certainty of this assessment is low due to the lack of information on impacts of introduction. The overall risk assessment category for *Ludwigia ovalis* is Uncertain.

## Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: Little information on this species from scientific journals was available in English.**
- **Overall Risk Assessment Category: Uncertain**

# 10 Literature Cited

**Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.**


Aqua Imports. 2022. Ludwigia ovalis. Boulder, Colorado: Aqua Imports. Available: https://www.aqua-imports.com/product/ludwigia-ovalis/ (March 2022).

Aqua Plants. 2022. Oval Ludwigia – Ludwigia ovalis – live aquatic plant. Liepaja, Latvia: Aqua Plants. Available: http://www.aquaplants.biz/plants/en/ludwigia-ovalis.html (June 2022).

Aqualabs. 2022. Ludwigia Ovalis. Available: https://www.aqualabs.com.au/products/ludwigia-ovalis (March 2022).

Aquarium Plants Factory. 2022. Ludwigia ovalis. Available: https://www.aquariumplantsfactory.com/products/ludwigia-ovalis (March 2022).

Aquasabi. 2022. Ludwigia ovalis Oval Ludwigia. Braunschweig, Germany: Aquasabi. Available: https://www.aquasabi.com/Ludwigia-ovalis (March 2022).

aquascaperoom. 2022. Potted Ludwigia Ovalis. Pickering, Ontario: aquascaperoom. Available: https://aquascaperoom.ca/potted-ludwigia-ovalis/ (June 2022).

Aquatic Arts. 2022. Oval Ludwigia (Ludwigia ovalis), bunch. Indianapolis, Indiana: Aquatic Arts. Available: https://aquaticarts.com/products/oval-ludwigia-ludwigia-ovalis-bunch (March 2022).

Buce Plant. 2022. Ludwigia Ovalis. Available: https://buceplant.com/products/ludwigia-ovalis (March 2022).

Canton Aquatics. 2022. Oval Ludwigia (Ovalis). Canton, Texas: Canton Aquatics. Available: https://www.cantonaquatics.com/products/oval-ludwigia-ovalis-buy-2-get-1-free (March 2022).

eFloras. 2022. *Ludwigia ovalis.* Flora of China. Available: www.efloras.org/florataxon.aspx?flora_id=2&taxon_id=200015092 (June 2022).

GBIF Secretariat. 2021. GBIF backbone taxonomy: *Ludwigia ovalis* Miq. Copenhagen: Global Biodiversity Information Facility. Available: https://www.gbif.org/species/5545183 (March 2022).

Glass Aqua. 2022. Ludwigia Ovalis. Available: https://shop.glassaqua.com/products/ludwigia-ovalis (March 2022).

Himadri Aquatics. 2022. Ludwigia Ovalis (3 stems). Alappuzha, India: Himadri Aquatics. Available: https://himadriaquatics.com/products/ludwigia-ovalis-2/ (March 2022).

Hossain MNEI, Mohsin ABM. 2020. Checklist of non-piscine ornamental aquatic organisms in Bangladesh. Journal of Fisheries and Life Sciences 5:26–29.

Indonesia Fish Exporter. 2010. Ludwigia Ovalis. Tangerang, Indonesia: Indonesia Fish Exporter. Available: https://indofishexporter.com/2010/01/15/ludwigia-ovalis/ (June 2022).

[ITIS] Integrated Taxonomic Information System. 2022. *Ludwigia* L. Reston, Virginia: Integrated Taxonomic Information System. Available: https://itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=27334#null (June 2022).

Liu SH, Yang HA, Kono Y, Hoch PC, Barber JC, Peng CI, Chung KF. 2020. Disentangling reticulate evolution of North Temperate haplostemonous *Ludwigia* (Onagracaea). Annuals of the Missouri Botanical Garden 105:163–182.

Raven PH, Tai W. 1979. Observations of chromosomes in *Ludwigia* (Onagraceae). Missouri Botanical Garden 66:862–879.

Sanders S, Castiglione C, Hoff M. 2021. Risk Assessment Mapping Program: RAMP. Version 4.0. U.S. Fish and Wildlife Service.

Tropical World Nursery. 2022. Ludwigia ovalis Oval Ludwigia bunch. Loxahatchee Groves, Florida: Tropical World Nursery. Available: https://www.tropicalworldusa.com/Ludwigia-ovalis-Oval-Ludwigia-bunch_p_3478.html (March 2022).

Wagner WL, Hoch PC, Raven PH. 2007. Revised classification of the Onagraceae. Systematic Botany Monographs 83:1–240.

[WFO] World Flora Online. 2022. *Ludwigia ovalis* Miq. World Flora Online – a project of the World Flora Online Consortium. Available: http://www.worldfloraonline.org/taxon/wfo-0001087412 (June 2022).

# 11 Literature Cited in Quoted Material

**Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.**

Li JT, Wang JS, Nian HH, Litvinchuk SN, Wang J, Li Y, Rao DQ, Klaus S. 2015. Amphibians crossing the Bering Land Bridge: evidence from holarctic treefrogs (Hyla, Hylidae, Anura). Molecular Phylogenetics and Evolution 87:80–90.

Patiño J, Goffinet B, Sim-Sim M, Vanderpoorten A. 2016. Is the sword moss (*Bryoxiphium*) a preglacial Tertiary relict? Molecular Phylogenetics and Evolution 96:200–206.

Raven PH. 1963. The Old World species of *Ludwigia* (including *Jussiaea*), with a synopsis for the genus (Onagraceae). Reinwardtia 6:327–427.

Wen J, Nie ZL, Ickert-Bond SM. 2016. Intercontinental disjunctions between eastern Asia and western North America in vascular plants highlight the biogeographic importance of the Bering land bridge from late Cretaceous to Neogene. Journal of Systematics and Evolution 54:469–490.