

An Ethnobotanical Note on *Nepenthes mirabilis* in Lao PDR

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The family Nepenthaceae (Tropical Pitcher Plants or Monkey Cups), consists of a single genus (*Nepenthes*) with >140 species (CHEEK & JEBB, 2013) occurring in southern China, India (Assam), Sri Lanka, Indochina, Malaysia, Indonesia, Philippines, northern Australia (Queensland), and eastern Madagascar (JUNIPER *ET AL.*, 1989; MCPHERSON, 2009). Nepenthaceae are characterized by liquid-containing pitchers suspended by tendrils growing from the leaf midrib (CLARKE, 2002). Pitcher plants obtain nutrients (especially nitrogen and phosphorous) by trapping and digesting invertebrate prey in the pitcher (ETKIN, 2008). Digestion of prey is accomplished by the combined action of enzymes and symbiotic insect larvae (flies, midges, and mosquitos) adapted to the low pH of the pitcher environment (JUNIPER *ET AL.*, 1989; CLARKE, 2002; ETKIN, 2008).

In contrast to many regions, the Nepenthaceae of Indochina (Laos, Thailand, Cambodia, and Vietnam) have received little scientific attention (MEY, 2010) and in particular, only a few reports on the ethnobotany of these plants are available from the region. According to VIDAL (1959) *Nepenthes* spp. is used to treat eruptive fever in Laos and in Cambodia, MEY (2010) stated that *N. mirabilis* is incorporated into medicines, the leaves and roots of *N. holdenii* are used in decoctions to treat fever and pain, and the roots of *N. bokorensis* are boiled and administered to pregnant women to alleviate pain. These reports notwithstanding, the general paucity of ethnobotanical information on *Nepenthes* in Indochina is somewhat surprising given the cultural, material, and medicinal significance of these plants elsewhere (ETKIN [2008] and references therein).

We here describe anthropogenic uses of *Nepenthes mirabilis* (Fig. 1) in Savannakhet Province of central Lao PDR (hereafter Laos). *Nepenthes mirabilis* is one of two species of *Nepenthes* (also *N. smilesii*) known to occur in Laos (MCPHERSON, 2009). We collected ethnobotanical information on *N. mirabilis* during November–December 2011 and July 2013 from 19 members of community conservation teams from Noa Neua and Dongyanong villages participating in a Siamese crocodile (*Crocodylus siamensis*) conservation program in Savannakhet Province (PLATT *ET AL.*, 2014b).

Noa Neua (population = 1,371) and Dongyanong (population = 793) are lowland (elevation < 200 m) agricultural villages along the Xangxoy and Champhone Rivers, respectively, inhabited largely by ethnic Lao (census data provided by village headmen to O. Thongsavath,

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20 October 2016) and located approximately 80 km apart (straight-line distance) (Fig. 2). Savannakhet Province is characterized by a monsoonal climate with a prolonged wet season extending from late May through October (BEZUIJEN ET AL., 2006). Rice is the principal crop (KOSAKA ET AL., 2006) and large expanses of natural wetlands have been converted to rice production (BEZUIJEN ET AL., 2006). The remaining natural wetlands are mostly vegetated oxbow lakes characterized by emergent stands of grasses and sedges, and floating mats of peat supporting herbaceous plants and small trees (BEZUIJEN ET AL., 2006; PLATT ET AL., 2014a). *Nepenthes mirabilis* is common near crocodile nesting sites on floating peat mats and in the sandy margins of non-alluvial wetlands (study sites described in greater detail by THORBJARNARSON ET AL. (2004) and PLATT ET AL. (2014 a). During fieldwork (PLATT ET AL., 2014 a, b), we showed team members living examples of *N. mirabilis*, asked the vernacular name, and inquired about local utilization of the plant.

According to our informants, *N. mirabilis* is known locally as *Khua Phong Peng*, which roughly translates as “intertwining vine”, a descriptive reference to the growth form of the plant. Our combined group of informants identified three local uses for *N. mirabilis*. Team members from Noa Neua (n=8) sometimes use pitchers to prepare sticky rice. The rice is steamed in the freshly harvested pitchers, which are consumed together with the rice and said to impart a delicate and pleasant flavor to the latter. On occasion, team members from Noa Neua have also tapped pitchers as an emergency source of drinking water when working in the forest during the dry season. Team members from Dongyanong (n=11) reported that liquor from the pitchers is an effective remedy for removing impacted wax from the ear. Although no attempt was made to evaluate the efficacy of this treatment, we speculate that enzymes and bacteria in the pitcher which digest invertebrate prey might also effectively degrade accumulated ear wax and thereby facilitate its removal. Interestingly, in this case ethnobotanical knowledge of *N. mirabilis* appears localized; each team reported unique ways to utilize the plant and neither group was familiar with the uses described by their counterparts. This suggests that a more geographically comprehensive sample of informants would likely yield additional ways that *Nepenthes* is used by villagers in Laos. In addition to information gleaned from village conservation teams, one of us (OT) who is a lifelong resident of Savannakhet Province has observed the pitchers of *N. mirabilis* being harvested, cooked, and consumed as a vegetable by villagers on the rural outskirts of Savannakhet.

Our report complements information provided by VIDAL (1959) describing the local uses of *Nepenthes* in Laos, and augments an already extensive literature on ethnobotany of the Nepenthaceae (reviewed by ETKIN [2008]). At least one of the uses that we documented for *Nepenthes* appears novel, namely the consumption of pitchers as vegetables. We are also unaware of any other reports of humans using pitchers as a source of drinking water, although primates are said to drink from pitchers (ZAHL, 1964). ZAHL (1964) tasted the water from immature pitchers (still sealed by the cap) and considered it preferable to older pitchers in which insects had begun to accumulate and “potable ... but hardly recommended for routine use”. Pitchers are also occasionally used to transport drinking water and as cooking and drinking vessels (PIETROPAOLO & PIETROPAOLO, 1986). In accordance with our findings, the use of pitcher contents to treat ear ailments appears widespread. RAZAFINDRAIBE ET AL. (2013) reported that pitcher contents are used to treat unspecified ear ailments in Madagascar. Pitcher contents are also considered an effective treatment for bacterial infections of the ear by indigenous groups in India (DOLUI ET AL., 2004; JAISWAL, 2010).



Figure 1. *Nepenthes mirabilis* growing on a floating peat mat adjacent to the nest of a Siamese crocodile (*Crocodylus siamensis*) in an oxbow lake near Dongyanong Village (Savannakhet Province, Lao PDR) (vertical length of pitchers = 13–15 cm).

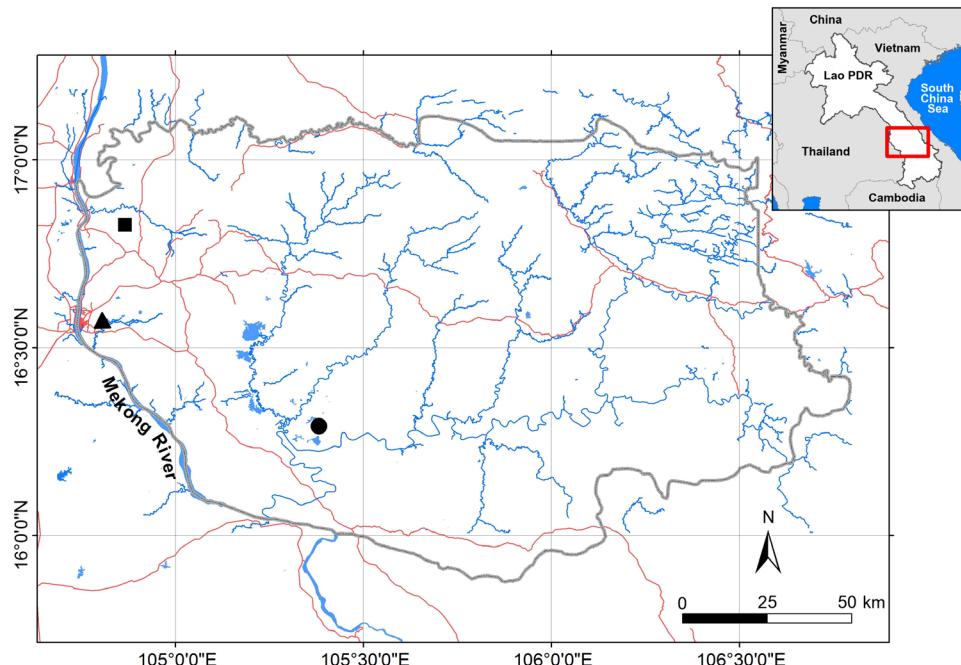


Figure 2. A map of Savannakhet Province (area enclosed within heavy gray line), Lao PDR showing locations mentioned in text: Dongyanong (●), Savannakhet (▲), Noa Neua (■). Red lines indicate major roads. The Mekong River, tributary streams and waterbodies are shown in blue. Inset (upper right) shows location of study area within Lao PDR.

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