

# Diversity of Invasive Plants in The Panjang Island Reserve Jepara Central java Indonesia

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**Submission date:** 03-May-2018 03:10PM (UTC+0700)

**Submission ID:** 958155166

**File name:** 17.\_Diversity\_of\_Invasive\_Plants\_in\_The\_Panjang\_Island.pdf (1.47M)

**Word count:** 1456

**Character count:** 8334



## Diversity of Invasive Plants in The Panjang Island Reserve Jepara Central Java, Indonesia

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Invasive vegetation are those introducing themselves into other ecosystems. They pose a threat on endemic biota as such that they cause environmental degradation. This study aimed to find out kinds of invasive vegetations and their distribution in the conservation forest of Panjang Island Jepara. The determination of observatory stations applied a purposive sampling. At each location invasive vegetations were identified. Data analysis was done by a descriptive-quantitative method through a calculation of constancy. Results of the study found 16 invasive vegetations from nine different families. The vegetations with the largest distribution area were *Lantana camara* L., *Leucaena glauca* L., *Euphorbia hirta* L., and *Stachytapherta indica* (L) Vahl. These invasive vegetations are necessary to be controled because of their threat endemic species as well as ecosystem sustainability of Panjang Island.

**Keywords:** Panjang Island, Invasive Vegetations, *Lantana Camara*, Endemic Biota.

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### 1. INTRODUCTION

Invasive vegetations are those introducing themselves into other ecosystems and causing economic disadvantage and environmental damage, even human health.<sup>1</sup> The existence of the invasive vegetations threats on the endemic biodiversity and modify the ecosystem. They have a higher competitiveness than the endemic vegetations. Therefore, they cause degradation of forest function including slow tree regeneration.<sup>2</sup>

The invasive vegetations may cause the loss of the endemic species in Indonesia. According to the threats they mount at particular area, the problem is very important to assess. Similar study in showed at Alas Purwo National Park, East Java, the dominant vegetation families of Compositae, Poaceae and Leguminosae.<sup>3</sup> The invasive vegetations at Boulvampatti forest in India were dominated by Asteraceae (15 species), Amaranthaceae (6 species), and Convulaceae (4 species).<sup>4</sup>

Panjang Island is an isle under the administrative area of Jepara Regency, Central Java Province. Due to its small size, the island is prone to environmental damage and change. Therefore, it is important to protect its existence. Problems faced by the ecosystems of Panjang Island facing with threats that may damage the ecosystems, such as abrasion, tourism, and pollution.

Concerning the effort of managing the sustainability of Panjang Island, the Municipal Government of Jepara has established

the island as a conservation area. It has also been officialized in the Local Act 2/2011 article 30 on Space and Area Plan of Jepara Regency 2011–2013, which requires that Panjang Island is to be establish for the conservation area for wildlife nursery ground.

The accuracy of the invasive vegetation may threat endemic vegetations and ecosystem of Panjang Island. This study aimed to identify the species of invasive vegetations and their distribution at the area of the conservation forest of Panjang Island.

### 2. EXPERIMENTAL DETAILS

The research location was determined by a purposive sampling method. Samples of vegetations were collected at eight different locations. At each location the study performed an observation of the invasive vegetations. The identification of the invasive vegetations were performed at the Ecology and Biosystematic Laboratory of The Department of Biology, the Faculty of Mathematics and Sciences, Diponegoro University. Data analysis of the vegetations was done by a descriptive-quantitative technique and by calculating the constancy degree of each vegetation.

### 3. RESULTS AND DISCUSSION

There were 16 invasive vegetations found at Panjang Island derived from nine different families. The most dominating invasive vegetations were *Lantana camara*, *Leucaena glauca*,

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**Table I.** Invasive vegetations diversity at panjang island conservation forest, Jepara.

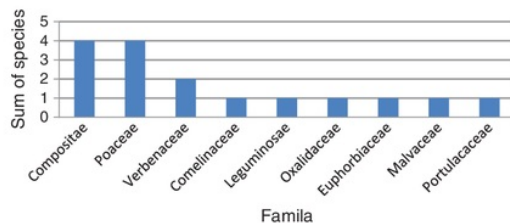
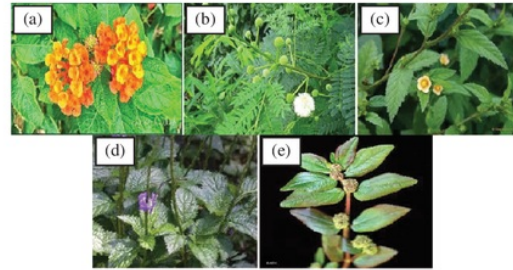
No.	Family	Species	Constance (%)	Endemic region
1	Compositae	<i>Ageratum conyzoides</i> (L.) L	18.18	America
2	Compositae	<i>Eclipta prostrata</i> (L.) L	18.18	America
3	Compositae	<i>Mikania micrantha</i> Kunth.	18.18	America
4	Compositae	<i>Tridax procumbens</i> (L.) L	9.09	America
5	Comelinaceae	<i>Comelina nodiflora</i> L.	27.27	America
6	Euphorbiaceae	<i>Euphorbia hirta</i> L.	54.55	America
7	Leguminosae	<i>Leucaena glauca</i> L.	81.82	America
8	Malvaceae	<i>Sida rhombifolia</i> L.	36.36	Asia
9	Oxalidaceae	<i>Oxalis corniculata</i> L.	9.09	Europe*
10	Poaceae	<i>Cynodon dactylon</i> (L.) Pers.	27.27	Asia/Africa
11	Poaceae	<i>Digitaria setigera</i> Roth.	9.09	Asia
12	Poaceae	<i>Paspalum conjugatum</i> P. J. Bergius	18.18	America
13	Poaceae	<i>Gigantochloa apus</i> (Schult.) Kurz	9.09	America
14	Portulacaceae	<i>Portulaca oleracea</i> L.	9.09	India/Africa
15	Verbenaceae	<i>Lantana camara</i> L.	100.00	America
16	Verbenaceae	<i>Stachytapheta indica</i> (L.) Vahl	36.36	America

*Euphorbia hirta*, *Sida rhombifolia*, and *Sachytapheta indica* (Table I and Fig. 1).

The largest distributive area was dominated by *Lantana camara*. It was proven by the constance degree of 100%. In other words, this species is found in anywhere part of the island. *Lantana camara* is the most dominating vegetation in Panjang Island.<sup>5</sup>

*Lantana camara* is an invasive vegetation originated from America. It is included in the 100 of the World's Most Invasive Alien Species.<sup>6</sup> Another study reported that the growth of *L. camara* is very fast and thus affecting the change in structure of the endemic species.<sup>7</sup> This species may disturb the growth of the endemic vegetation through spatial competition and cause decrease in species biodiversity by dominating the lower vegetations. *L. camara* also produces allelopathy substance, which impedes the growth of the surrounding vegetations.<sup>8,9</sup> The competition against *L. camara* results in the change in structure of the endemic vegetations and the decrease in sapling density of the main stand. Furthermore, this species also threatens the endemic vegetations at individual or larger scales.<sup>7</sup>

As an invasive vegetation, *L. camara* is able to grow and to reproduce fastly and has a high tolerance to the environmental factors.<sup>10</sup> The species is one of most disturbing vegetations at the National Park of Alas Purwo, East Java.<sup>11</sup>

**Fig. 1.** Numbers of invasive vegetations by family.**Fig. 2.** (a) *Lantana camara* L., (b) *Leucaena glauca*, (c) *Sida rhombifolia*, (d) *Stachytapheta indica* (L.) Vahl.ande. *Euphorbia hirta* L.

The most dominating invasive vegetations found were those from Compositae and Poaceae families. Both families are producing many seeds, seed dispersal effective and quickly formed shade so as to invade the region.<sup>2</sup> Similarly, the previous study also found them at the National Park of Gunung Gede Pangrango, West Java.<sup>11</sup>

#### 4. CONCLUSION

The study found sixteen invasive vegetations from nine different families. The most invasive vegetations at the research location were *Lantana camara* L., *Leucaena glauca*, *Euporbhia hirta* L., and *Stachytapheta indica* (L.) Vahl. These five vegetations were so invasive that further monitoring is necessary in order to prevent them from threatening the endemic vegetations and damaging the ecosystems at the conservation forest of Panjang Island.

**Acknowledgments:** This research was funded by the Directorate of Research and Community Service (DRPM) of the General Directorate of Research Empowerment and Development, the Ministry of Research, Technology and Higher Education. Number: 022/SP2H/Lt/DRPM/II/2016 dated February 17, 2016. The author is indebted to all assisting students during the vegetation sampling: Imam, Peny, Nabila, Alam, Meyza.

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Received: 5 September 2016. Accepted: 13 December 2016.

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