

Ethnobotany Yor-nyiuran (*Physalis angulata* L.) Family Solanaceae in Madura, East Java, Indonesia

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Abstract Madura Island is well known for its traditional herbal ingredients that have been produced from generation to generation. Yor-nyiuran (*Physalis angulata* L.) is one of a small species by local Madurese people used medicine, food and growth wilds. Examination of herbarium material was carried out based on Herbarium Brawijaya University (HBUR). This explorative study uses open-ended interviews and semi-structured interviews. Result of this study is important to be used as basic information function in human life is for traditional medicine (high blood pressure, diabetes mellitus, cancer) sometime food and variation species in the Madura island, East Java. This research shows that the yor-nyiuran plant grows wild and in the agricultural environment of Madura Island, identified is new record as *Physalis angulata* L. These results also indicate the importance of the yor-nyiuran plant for the Madurese community, especially in its use as medicine.

Keywords Yor-nyiuran (*Physalis angulata*), Madura island, Madurese people, East Java

1. Introduction

Ethnobotany also learns about how people from certain cultures and regions make use of plants native to certain areas. History has shown human dependence on plants to meet their various needs. Ethnobotany is the study of the relationship between humans and plants [8,12]. Besides contributing to the air we breathe, plants also provide clothing, food and shelter. Many indigenous people also use plants in spiritual ceremonies or rituals. Ethnobotany helps people gather information about how people have traditionally used certain plants as medicinal plants, what diseases can be treated and how are they used in medicine [8,5]. The genus yor-nyiuran, ciplukan (*Physalis* spp.) is herbaceous shrubs, hollow stems, round-ribbed, smooth surface, green-white-dark. The bell-shaped, ribbed flowers are included in the nightshade family Solanaceae. Information from Flora of Java [3] by stated that in Java there are 3 types of yor-nyiuran namely *Physalis minima*, *P. angulata* and *P. peruviana*. *Physalis peruviana* grows and is spread between cultivated plants and forests with an altitude of 1000-2400 meters above sea level, while *P. minima* and *P. angulata* grow optimally at an altitude of 2-600 meters above sea level [6]. This family member grows wild among cultivated plants and is toxic, but can be used as fruit and medicinal ingredients [6,14]. Members of this genus are

scattered in locations with a variety of altitudes, special temperature environments and like fertile places, spread from subtropical-tropical regions [2].

The Madurese with their unique language and culture are one of the second largest tribes in East Java who occupy the island of Madura. Madurese ciplukan plant is called yor-nyiuran (*Physalis* spp.), rarely cultivated and grows wildly but can be used for various purposes, including traditional medicinal ingredients; high blood pressure, diabetes mellitus and drugs exposed to toxins. [17,22,16,18, 13] reported informed that *Physalis* spp. by local people used to increase appetite, mouth sores, tonics, diuretics, laxatives, inflammation, and enlargement of the spleen and stomach problems. The purpose of this study is to determine the diversity of yor-nyiuran species (*Physalis* spp.) and reveal knowledge about its benefits on the island of Madura.

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2. Materials and Methods

The study based on the examination of the material from Herbarium Biology of Brawijaya University (HBUR) collection,

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fresh material from Madura island areas covers Sampang Regency, Pamekasan Regency and Sumenep Regency (Fig. 1), East Java Indonesia. Standard plant specimen collection techniques were employed. From the collection studied by the author, details and descriptions from dried material, except for floral and fruit sizes, which were based on dehydrated (boiled in water) material. Terminologies follows [7,11] and methods follows by [4]. The research was conducted using explorative study used indept interview, semi-structure [8,12].

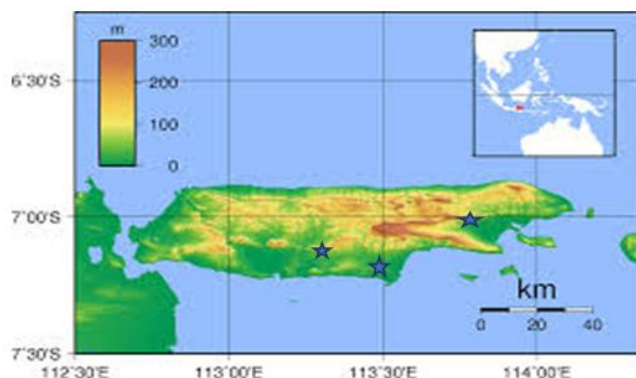


Figure 1. Madura island Map, star sign regency (Sampang, Pamekasan and Sumenep) (Anonymous, 2020)

3. Results and Discussion

Physalis angulata L.

Flora of Java 2 (1968): 467-468; Sp. Pl. 1: 183. 1753; Sendtner in Martius, Fl. Bras. 10: 130. 1846. Lectotype (designated by D'Arcy, 1974: 662): "Habitat in India utraque," Herb. Linn. No. 247.9 (LINN) *fide* D'Arcy in Woodson & Schery (ed.), *Ann. Missouri Bot. Gard.* 60: 662

(1974). Isolectotype of *Physalis angulata* L. Edward (1887) Mexico. YPM YU YU 065297.

Physalis angulata L., sinonim *Physalis glaberrima* Colla (De Moraes *et al.*, 2014)

Branched roots, white-yellowish color. Terrestrial, herbaceous, seasonal-perennial, upright, branched, more or less, 0.29 cm- 0.85 m high. Stem diameter 0.3-1 cm, rectangular ribbed sharp-round, smooth, hollow, green-brown surface interspersed with pink, smooth to fine-haired dense-sparse (pubescent). The internodes are 3-8 cm long, the nodes are slightly enlarged, where the shoots, petioles and flowers appear. Petiole is quadrilateral lengthening 2,3-6 cm, oval leaf blade extending to a lanceolate shape, 3-11 cm x 2,5-6 cm with pointed-tapered tip, flat edge or sharp serrated, with fine hair; the base of the leaves is pointed at different distances up to 0.2-0.8 cm; upper leaf surface green-gloomy, lower surface green-whitish. The flowers are axillary and solitary intersection of the branches of the stem. Upright flower stalk with a round nodding tip, 1-1.5 mm in diameter, appears on the armpits of each branch, green, violet-brown 0.8-3 cm. Elongated round petals, sticky green, 1.5-2.7 x 1.7-2.5 cm, 5 slits, sharing a triangular shape at the tip, 1 cm taper, ribbed brown-violet with fine white hair. Bell-shaped crown of light yellow-yellow color with a green base, 7-9 mm, edge notched 5; deep neck with yellow-brown stain; on each node there are clusters of short, dense hair in a 'v' form or spiral. Stalk 1 mm, pale yellow; anthers 1 mm, light blue. Sleek pistil, button-shaped head. The adult fruit petals are oval hanging green, while the old ones are yellow, 2.1-2.4 x 3-3 cm veined brown-violet. Buni fruit, in large quantities per individual, slightly elongated round, rounded tip, 1-1.3 x 1-2 cm, smooth, shiny, green when young, medium ripe yellow. Young seeds are white scattered on the edge and center (Figure 2,3).

Table 1. Collection specimens in Madura Island

No Coll	Location	Altitude	Coordinate	Collector
1	Vilages Bangkes, Kadur sub-district, Pamekasan district, Madura island	145.9 m asl	-7°4'58''S, 113°32'22''E	Jamilatus
2	Vilages Bangkes, Kadur sub-district, Pamekasan district, Madura island	148.2 m asl	-7°4'52''S, 113°32'16''E	Jamilatus
3	Vilages Bangkes, Kadur sub-district, Pamekasan district, Madura island	158.2 m asl	-7°5'57''S, 131°31'39''E.	Jamilatus
4	Temberuh Barat Village, Sokobanah Sampang sub-district, Madura island	122 m asl	-7°3'10''S, 113°41'50''E	Jamilatus
5	Temberuh Barat Village, Sokobanah Sampang sub-district, Madura island.	128.7 m asl	-7°3'10''S, 113°41'49''E	Jamilatus
6	Temberuh Barat Village, Sokobanah Sampang sub-district, Madura isand	129.2 m asl	-7°3'10''S, 113°41'49''E.	Jamilatus
7	Temberuh Barat Village, Sokobanah Sampang sub-district, Madura island	66 m asl	-6°53'45''S, 113°27'54''E	Jamilatus
8	Temberuh Barat Village, Sokobanah Sampang sub-district, Madura island	62 m asl	-6°53'45''S, 113°27'54''E	Jamilatus
9	Temberuh Barat Village, Sokobanah Sampang sub-district, Madura island	62 m asl	-6°53'45''S, 113°27'59''E.	Jamilatus

Notes: Rectangular rod, glossy smooth surface. Flowers with green petals, yellow-white crown; young fruits slightly elongated round shape, green, ripe yellow (Fig 2). Distribution of research results on the island of Madura, between 62 m asl - 158.52 m asl. (Table1). According to [3] *Physalis angulata* L. can grow up to 1-1550 m asl, bright green petals, yellow flowers.

Distribution: Grows wild in gardens, yards, moorlands, near ditches, rice fields between maize crops (*Zea mays*), Gramineae, soto, mbako, tobacco (*Nicotiana tabacum*), rice (*Oryza sativa*), oranges (*Citrus* spp.), brol nuts (*Arachis hypogaea*), a residential area, near trash cans and roadsides. The distribution of *Physalis angulata* at the research location is 62-158.2 m above sea level, while [3] reported that it

grows at 1-1555 m above sea level.

Local name: Yor-nyiuran (Madurese), ciplukan (Java), kopo keceplokkan (Kangean island).

Used: The number of informants at the three survey locations was fifteen people (Pamekasan, Sampang, Sumenep) (Table 1). According to the local Madurese community, it is mainly for the treatment of high blood pressure, diabetes mellitus, fever, stomach ache, fever, prostate, cancer, cholesterol and facilitating breastfeeding. Meanwhile, the traditional way of concocting is to use all the organs or parts of the leaves, the fruit is then cleaned, boiled and the water is drunk with a bitter taste. Yor-nyiuran (*Physalis angulata* L.) has meaning it is quite important species in Madurese people.



Figure 2. Specimen Yor-nyiuran (*Physalis angulata* L.)

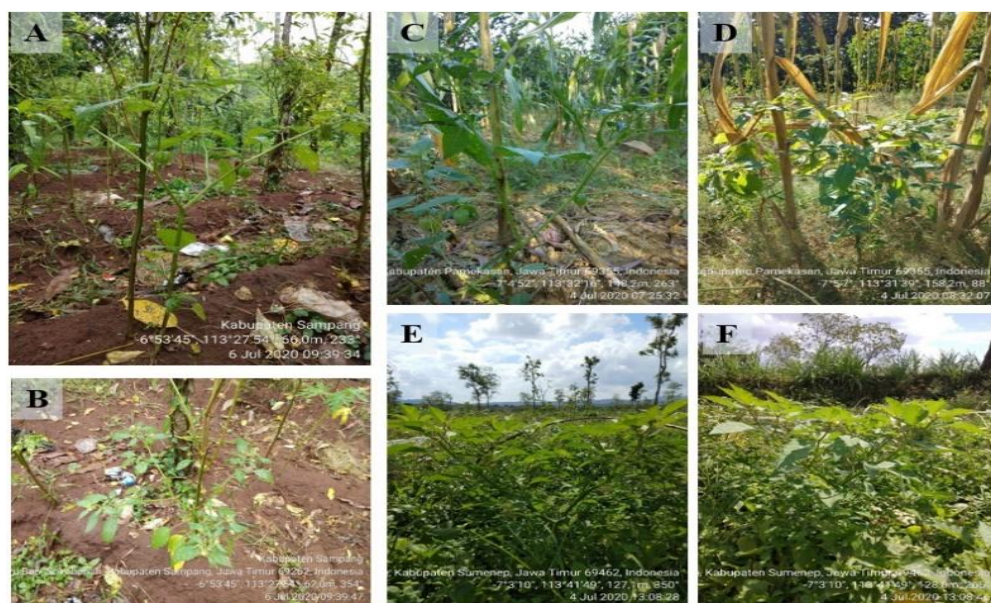


Figure 3. The location of sampling for the accession of yor-nyiuran (*Physalis angulata*) plants in three districts in Madura island. A-B: Sampang, C-D: Pamekasan, E-F: Sampang

Discussion: Yor-nyiuran (*Physalis angulata* L.) is a herbaceous-shrub, rectangular stem, 0.2-0.7 m high, and slightly dark green-white. Round petiole, oval leaf blade elongated to a lanceolate shape, with a pointed tip, flat-edged, fine hair (pubescent); the base of the leaves is pointed or tapered, the upper surface of the leaves is green-gloomy, the lower surface is green-whitish. Green-white petals, sparse hair, pubescent, shiny green young fruit, ripe red-yellow-pink, sour-sweet taste. According to [15] *Physalis angulata* contains anti-inflammatory activity. [20] reported the basis of these herbal characters, the plant is traditionally used as medicine to cure various disorders like asthma, kidney, bladder, jaundice, gout, inflammations, cancer, digestive problems and diabetes. Yor-nyiuran is generally known by the local community as a medicinal ingredient. Madurese farmer children use toys and ripe fruit as fruit.

Yor-nyiuran (*Physalis angulata* L.) (Fig.3) grows well on fertile sand, loam, and loam soils, among the cultivated plants of mustard greens, paitan (*Tithonia diversifolia*), banana, gedang (*Musa paradisiaca*), corn (*Zea mays*), singkong, cassava (*Manihot esculenta*), beans (Fabaceae) scattered in yards, moor, rice fields, roadsides, and forests [20,6,14]. The people of Madura in general are familiar with the yor-yoran plant which uses it as fruit and traditional medicine, especially in rural areas.

According to the local Madurese community, yor-nyiuran (*Physalis angulata* L.) can treat 9 types of diseases including: diabetes, cancer, fever, fever, prostate, high blood pressure, stomach ache, accelerating breast milk, uric acid, food / fruit and cholesterol. Yor-nyiuran plant types can be developed in a tissue culture and contain both toxic and medicinal substances [21,19,16,10,14]. The Madurese people have the knowledge that yor-nyioran can be used for drugs and toys for children from generation to generation. Leaf organs have a value of 100% used for the treatment process compared to other organs. The results of ciplukan mature and belta which means that people's perceptions are sufficiently understood to be used as medicinal ingredients. [14] reported *Physalis angulata* L. from Madura environmental conditions significantly affects response of seed germination. Ex vitro germination was carried out in mixed soil media compost covers husk charcoal whereas in vitro germination was carried out in agar-solidified medium.

4. Conclusions

Based on studies one species of *Physalis angulata* L. is new record from Madura island, East Java. Ciplukan, yor-nyiuran (*Physalis angulata* L.) important to be used as basic information function in human life is for traditional medicine. Yor-nyiuran (*P. angulata* L.) can treat 9 types of diseases including covers diabetes mellitus, cancer, fever, prostate, high blood pressure, stomach ache, accelerating breast milk, uric acid, food/fruit and cholesterol. sometime food and meaning it is quite important species in Madurese community.

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