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SURVEY AND CHARACTERIZATION OF CEMETERY FLORA BASED ON LOCATION ELEVATION IN JAVANESE COMMUNITIES, INDONESIA

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ABSTRACT

Graves are cultural landscapes, designated as green open spaces, often known as jaratan, kramatan, pesarean, astana, or kuburan. Cemeteries are crucial locations with architectural art, cultural traditions, historical evidence, sacred and religious significance, a tranquil atmosphere, diversity, and natural beauty. The purpose of this study was to determine the diversity of major flora in burial grounds and cultural traditions, based on the altitude of locations in East Java and Yogyakarta. The survey results at the three burial sites recorded 34 families, including: 18 families identified in the Tengger tribe, 21 families in Malang city, and 19 families identified in Temon subdistrict. There are 20 species of trees that are considered sacred by the community and are used in traditional rituals, religious activities, and traditional conservation practices.

Keywords : Survey, cemetery flora, location elevation, Java.

Introduction

Funerals are a tangible form of expression that continues to evolve in line with the cultural dynamics of the surrounding community. A tomb can be defined as a place for burying the bodies of people who have died. Burials include: a series of administrative activities, grave site arrangements, coordination, as well as the provision of technical guidance or instructions and supervision (Republic of Indonesia, 1987).

Culture comes from the Sanskrit word meaning reason and intellect. The behavior of individuals or certain groups in society that is inherited, but can also undergo change Waluyo (2024) explains human culture in relation to ethnology as a science that attempts to reveal the basic concepts of human culture through ethnographic summaries, racial characteristics, artifacts, and local languages. Cultures based on values, worldviews, and beliefs passed down from generation to generation, whether written or unwritten, form patterns of worship and cultural rituals (Monitha *et al.*, 2021). Humans possess knowledge and the ability to adapt to their environment, which is due to

their creativity, feelings, and intentions. One of the local cultural landscapes in the form of a cemetery is a manifestation of human knowledge and thought that has been applied and passed down. Towle, in his book *Grave History*, explains that burial sites are physical markers of the existence of graves, containing a wealth of important information about where and when the graves were built. These markers are key to uncovering the history of the past, the names of individuals, and the personal lives of those buried there. From the evaluation of 97 studies on burial grounds, Loki *et al.* (2019) described that cemeteries around the world provide protection for the burial landscape for populations of rare and even endangered species of flora and fauna.

Indonesia has a rich and diverse cultural heritage with unique characteristics regarding burial practices in each ethnic group. Burials and traditional ceremonies have been carried out continuously from generation to generation in a spirit of mutual cooperation. They represent local wisdom and are considered sacred traditions. According to Ginaris in Nurhadi (1997), burial is a series of steps beginning with digging the

ground, placing the body in the hole, covering it back up, and marking it with a sign or symbol so that it can be recognized by the general public. The research conducted by Chandra and Rahmat (2020) used a historical and archaeological approach, using historical facts to draw connections, while archaeology examined the graves.

Sacred tombs are better preserved as natural conservation areas than general conservation areas because they are well maintained by the local community itself (Batoro *et al.*, 2022). Meanwhile, sacred sites are sacred areas closely related to humans, biological resources (flora and fauna) as a manifestation of the integration between culture and natural values and conservation (Ginaris *et al.*, 2019; Lee and Shaaf, 2003; Nowisnska, *et al.*, 2020; Batoro *et al.*, 2025). Therefore, research on the diversity of flora in cemeteries is a manifestation of concern for in-situ and ex-situ conservation, culture, philosophy, and local wisdom.

Material and Methods

The survey was conducted in three locations surrounding burial grounds: the Tengger community at an altitude of 700-2100 meters above sea level; the Javanese community in the city of Malang at an altitude of 300-650 meters above sea level (m ASL); and the Temon community in Kulon Progo, Yogyakarta, at an altitude of 10-300 meters above sea level. The diversity of major and sacred flora species was determined through in-depth interviews with traditional elders, shamans, local communities, and scientifically determined. The determination and nomenclature of the listed plants were based on the Flora of Java, and Checklist of Generic Names in Malasian Botany (Steenis, 1987). A questionnaire method was adopted for documentation of ethno-botanical knowledge Malang society in Tengger, Malang and Yogyakarta. The interviews were carried out from local community to document local name and ethno-botanical uses (Cotton, 1996; Hoffman, & Gallaher 2007).

Results and Discussion

Based on the results of the research, graves in Java can be divided into: the Pakualaman Royal Cemetery (Girigondo), public cemeteries, private cemeteries (family groups), Heroes' Cemeteries (TMP), Dutch cemeteries (Kerkhof), and Tengger cemeteries (Fig. 1) and Danyang graves, Pamujan shrines in Tengger. The characteristics of graves depend on the altitude of the location, the cultural customs of the community, the species of flora and fauna, the purpose of the area, and urbanization. The

Tengger traditional burial ceremony consists of a burial ritual, but the most important part is Entas-entas, which is the final phase followed by the burning of the petra in the pedanyangan to release the arwan/spirit/atman to the realm of the gods (heaven, kelangengan). Meanwhile, traditional Javanese funerals involve burial ceremonies, followed by ceremonies on the third day, seventh day, hundredth day, and finally on the thousandth day. Traditional ceremonies for local holidays (weton): Jumat Legi (East Java), Jumat Kliwon (Yogyakarta), and Nyadran. The classification of grave locations includes: Pakualam graves (Astana Girigondo), Public Cemeteries (TPU), private graves (family groups), Heroes' Cemeteries (TMP), Dutch graves (Kerkhof) (Hapsari, 2017; Rukmana *et al.*, 2022; Batoro *et al.*, 2025) and special graves and ritual sites (Danyang, Sanggar Pamujan).

The diversity of flora in the Tengger tribe's burial grounds (Figure 1), at an altitude of 700-2100 meters above sea level, includes: Casuarinaceae: cemara gunung (*Casuarina junghuhniana*), Moraceae: ringin (*Ficus benyamina*), preh (*Ficus microcarpa*), kebek (*Ficus grossulasioides*), bulu (*Ficus villosa*); Cupressaceae: *Thuja orientalis*; Arecaceae: piji (*Arenga coronata*), aren (*Arenga pinnata*); Asparagaceae: andong (*Cordyline fructicosa*), Hypoxidaceae: tlotok (*Curculigo capitulata*), Apocynaceae: kamboja (*Plumeria rubra*), Araucariaceae: damar (*Agathis dammara*), Pinaceae: pinus (*Pinus merkusii*), Fagaceae: pasang (*Castanopsis acuminatissima*). Meliaceae: suren (*Toona sureni*), Apiaceae: pampung (*Oanthe javanica*), adas (*Foeniculum vulgare*), Euphorbiaceae: puring (*Codiaeum variegatum*); Asteraceae: putihan (*Buddleja asiatica*), *Anaphalis javanica*; Solanaceae: cubung (*Brugmansia suaveolens*, *Brugmansia candida*); Juglandaceae: danglu (*Engelhardia spicata*): paitan (*Tithonia diversifolia*).



Fig. 1: The graves of the Sedaeng Tengger tribe in the Bromo Tengger Semeru Biosphere Reserve

The graves of Malang regency and city (400-700 m above sea level) (Fig. 2) include: Fabaceae: trembesi (*Samanea saman*), sono (*Pterocarpus indicus*), Sapindaceae: kerai payung (*Filicium desipiens*). Myrtaceae: klampok (*Syzygium densiflorum*), klengkeng (*Dimocarpus longan*), jambu klutuk (*Psidium quajava*); Euphorbiaceae: puring (*Codiaeum variegatum*), Araliaceae: mangkoan (*Polyscias scutellaria*), Asteraceae: paitan (*Tithonia diversifolia*), kerinyu (*Chromolaena odorata*); Asparagaceae: andong (*Cordyline fruticosa*), suji (*Dracaena angustifolia*); Annonaceae: kenanga (*Cananga odorata*), glodokan (*Polythia longifolia*), Moraceae: lo (*Ficus racemosa*), preh (*Ficus microcarpa*), awar awar (*Ficus septica*), bulu (*Ficus villosa*); Rosaceae: mawar (*Rosa hybrida*), Apocynaceae: kamboja (*Plumeria rubra*), kenari (*Thevetia peruviana*); Musaceae: gedang (*Musa paradisiaca*); Caricaceae: kates (*Carica papaya*), Cupressaceae: (*Thuja orientalis*); Rutaceae: maja (*Aegle marmelos*); Meliaceae: mahoni (*Swietenia macrophylla*); Poaceae: bambu (*Bambusa blumeana*, *Dendrocalamus asper*), Nyctaginaceae: *Bougainvillea spectabilis*, Rubiaceae: pace (*Morinda citrifolia*), nusa indah (*Musaenda frondosa*), jabon (*Anthocephalus cadamba*), Sapotaceae: tanjung (*Mimusops elingi*), Anacardiaceae: mangga (*Mangifera indica*).



(a)



(b)

Fig. 2 : Location of the graves. (a) Madyopuro public cemetery and (b) Untung Suropati Malang Heroes Cemetery (TMP).

In the lowland cemetery area (Temon), (fig. 3b), at an altitude of 10-300 meters above sea level: Malvaceae: kepuh (*Sterculia foetida*); Oxalidaceae: blimbing macan (*Averrhoa carambola*), Myrtaceae: duwet (*Syzygium cumini*), Arecaceae: kambil (*Cocos nucifera*); Anacardiaceae: jambu monyet (*Anacardium occidentale*); Calophyllaceae: nyamplung (*Calophyllum inophyllum*); Gnetaceae: melinjo (*Gnetum gnemon*); Pandanaceae: pandan ri (*Pandanus tectorius*), pandan wangi (*Pandanus amarylifolius*); Bombaceae: randu alas (*Bombax ceiba*); Lamiaceae: jati (*Tectona grandis*); Gramineae: bambu: (*Dendrocalamus asper*, *Gigantochloa atter*, *Gigantochloa atroviolacea*); Moraceae: awar-awar (*Ficus septica*), serut (*Streblus asper*), lo (*Ficus racemosa*); Verbenaceae: telekan (*Lantana camara*); Apocynaceae: biduri (*Calotropis gigantea*), kamboja (*Plumeria rubra*), kenari (*Thevetia peruviana*). Fabaceae: johar (*Senna siamea*), mlandingan (*Leucaena leucocephala*); Euphorbiaceae: puring (*Codiaeum variegatum*); Araliaceae: mangkoan (*Polyscias scutellaria*); Rutaceae: maja (*Aegle marmelos*).



(a)



(b)

Fig. 3: Graves in Temon subdistrict. (a). Astana Girigondo, (b) Graves in Glagah village

The diversity of flora in the three locations shows differences in several species, due to factors such as altitude and community culture. A total of 34 families in the three research locations recorded 18 species of

sacred trees. Meanwhile, the results of the flora inventory in the Honggoderpo Wonosobo cemetery in Central Java recorded a total of 158 species from 57 families (Ristiawan *et al.*, 2022). Several species of plants found in graves at three locations are used for traditional medicine, food, poison, and traditional and religious rituals, according to (Grabalow & Nordh, 2022).

The presence of grave trees provides shade, and green cover groups can maintain the microclimate, environmental temperature, oxygen (O₂) sources, water sources, carbon dioxide (CO₂) absorption, and noise absorption (Siswanto & Batoro, 2019). The magical nature of the sacred (haunted) cemetery depicts a quiet, religious atmosphere with various elements of belief and unique biodiversity (Bushan, & Kyajuria, 2018; Santos & Casimiro, 2024; Batoro, *et al.*, 2025). The biodiversity of the cemetery environment as a sacred place serves to conserve flora and fauna in situ and ex situ, as well as to provide an atmosphere of beauty, tranquility, fragrance, sacredness, cultural traditions, and religious tourism (Kunming and Xishuangbanna, 2003; Lee and Shaaf, 2003; Batoro *et al.*, 2019).

Within the cemetery grounds, 20 species of trees revered by the community have been identified: cemara gunung (*Casuarina junghuhniana*), trembesi (*Samanea saman*), mahoni (*Swietenia macrophylla*), kepuh (*Sterculia foetida*), randu alas (*Bombax ceiba*), ringin (*Ficus benyamina*), preh (*Ficus microcarpa*), bulu (*Ficus villosa*), kebek (*Ficus grossulasioides*), pampung (*Oenanthe javanica*), lo (*Ficus racemosa*), serut (*Streblus asper*), danglu (*Engelhardia spicata*), duwet (*Syzygium cumini*), nyamplung (*Calophyllum inophyllum*); kamboja (*Plumeria rubra*), kantil (*Magnolia alba*), klampok (*Syzygium densiflorum*), *Thuja orientalis* and aren (*Arenga pinnata*).

Some ornamental plants are beautiful in color and have fragrant flowers: puring (*Codiaeum variegatum*), mawar (*Rosa hybrida*), andong (*Cordyline fruticosa*), pandan wangi (*Pandanus amarylifolius*), kamboja (*Plumeria rubra*), and kantil (*Magnolia alba*). However, each burial site has different biodiversity characteristics. Meanwhile, wild ground cover flora includes: grasses (Poaceae), sedges (Cyperaceae), sunflowers (Asteraceae), legumes (Fabaceae), ferns (Pteridophyta), algae, mosses (Bryophyta), lichens (Lichenes) and fungi. In some vacant areas, cultivated plants were found on the edges of the cemetery: gedang (*Musa paradisiaca*), kates (*Carica papaya*), rambutan (*Nephelium lappaceum*), nongko (*Artocarpus heterophyllus*), mlandingan (*Leucaena leucocephala*), pohong (*Manihot esculenta*), mangga (*Mangifera indica*), jambu klutuk (*Psidium guajava*), talok (*Muntingia calabura*), mbote (*Colocasia esculenta*),

jagung (*Zea mays*), lombok riwit (*Capsicum frutescent*).

Local customs that are a form of local wisdom are still practiced by the community in the form of grave cleaning (Nyekar): Nyadran, Karo (village cleaning), Friday Legi (typical of East Java) and Kliwon (typical of Central Java, Yogyakarta). In contrast, the Untung Suropati Heroes Cemetery in Malang City is always kept clean with various facilities and sufficient funds available (Fig. 2b).

Conclusions

Cemeteries are Green Open Spaces (RTH) with various architectural sculptures on tomb buildings, culture, philosophy, meaning, symbols, and conservation of species diversity in the cemetery environment. The location of the tomb is considered sacred by the community and is used for various traditional rituals (neton, death rituals, nyadran), religious activities, and has been developed as a religious tourist destination. The sacred tree diversity consists of 20 species, and the entire tomb environment is recorded as having 34 families.

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