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Verdin, A.P., 2014, A quasi-global precipitation time series for drought monitoring: U.S. Geological Survey Data Series 832, 4 p.

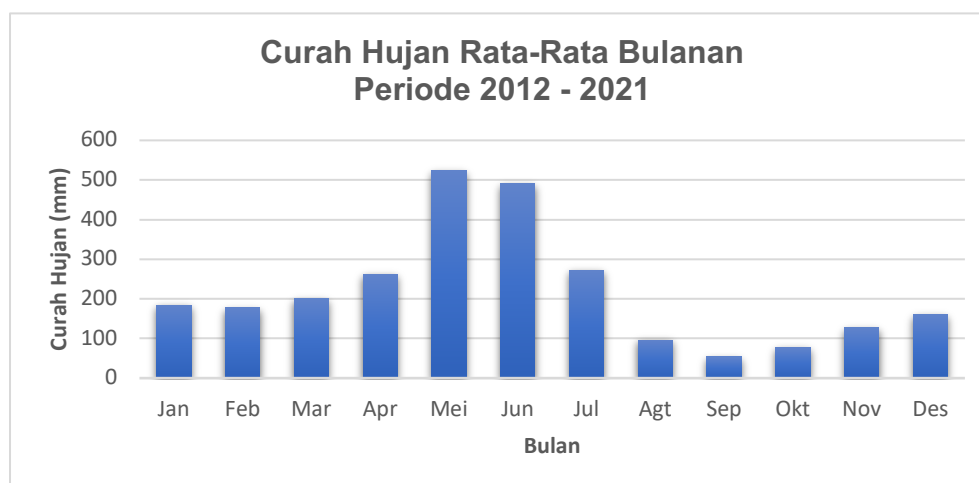
LAMPIRAN

Lampiran 01.

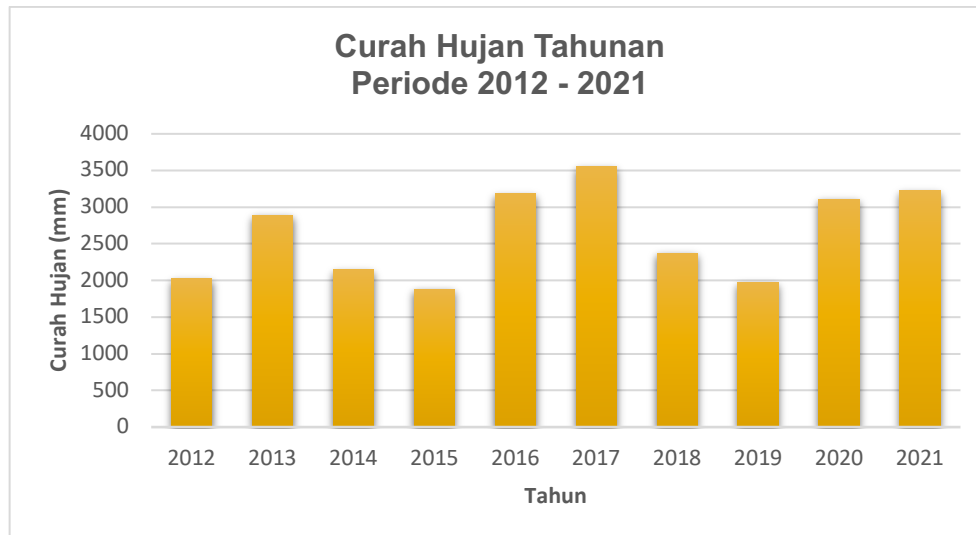
Tabel. Data curah Hujan Rata-rata Bulanan selama 10 tahun di Desa Sallasae

Tahun	Curah Hujan Bulanan (mm)												Jumlah
	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sep	Okt	Nov	Des	
2012	166	172	272	171	584	153	184	63	32	38	60	132	2027
2013	176	119	94	339	471	730	447	44	23	36	196	215	2890
2014	204	127	214	311	469	267	239	51	15	30	43	173	2143
2015	209	247	104	239	325	427	99	38	15	25	32	128	1888
2016	122	216	220	338	282	775	276	141	117	309	184	202	3182
2017	204	146	227	178	781	920	338	217	62	74	249	161	3557
2018	156	212	143	231	485	502	193	57	19	29	139	210	2376
2019	237	199	218	347	333	299	90	47	19	40	50	93	1972
2020	170	222	308	302	933	444	212	82	89	92	108	148	3110
2021	217	115	214	183	582	404	641	242	149	105	224	150	3226
Rata-Rata	186	177	201	264	524	492	272	98	54	78	128	161	2637

Sumber : CHIRPS 2021 (diakses 20 Oktober 2022)



Gambar: Rata-rata curah hujan bulanan periode 2012-2021



Gambar : Rata-rata curah hujan tahunan periode 2012-2021

1. Output Penelitian satu

Isolation, characterization and identification of nitrogen fixing bacteria with organic fertilizer applications in paddy soil

2. Output Penelitian dua

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Research Article

Isolation, Characterization and Identification of Phosphate Solubilizing Bacteria (PSB) In Natural Farming Paddy Soil in Salassae Village, Bulukumba Regence, South Sulawesi Province, Indonesia

HADIJA^{1,2}, T. KUSWINANTI³, M. JAYADI⁴, SH. LAREKENG⁵, M. NADIR⁶

¹Agriculture Study Program, Hasanuddin University Makassar Graduate School 90245, South Sulawesi, Indonesia.

²Department of Soil Science, Faculty of Agriculture, Moslem University Maros 90512, South Sulawesi Indonesia.

³Department of Soil Science, Faculty of Agriculture Hasanuddin University Makassar 90245, South Sulawesi Indonesia.

⁴Department of Forestry, Faculty of Forestry, Hasanuddin University Makassar, 90245, South Sulawesi, Indonesia. Makassar, Indonesia.

⁵Faculty of Animal Science Faculty, Hasanuddin University Makassar, 90245, South Sulawesi, Indonesia. Makassar, Indonesia.

* Corresponding Author:

Email: dnija01@gmail.com

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One of the most needed macronutrient elements is Phosphate (P). Still, most low availability in the soil, because most of the phosphate fertilizer added, does not leach into the ground making it unavailable to plants. Phosphate Solubilizing Bacteria (PSB) is one of the soil microorganisms that can improve Phosphate's soil's supply. This study aims to isolate, characterize, and identify phosphate solubilizing bacteria in paddy soils using the natural farming system to increase phosphate availability in the ground—this study using the approach method morphology, biochemistry and identification molecular to characterize and identify PSB isolates. Results The isolation of bacteria from the research location was successful twenty-three bacterial isolates. Furthermore, the macroscopic characterization results vary considerably from the shape of the colony from irregular to rooted. Test Pospat's dissolving ability obtained at six the bacterial isolate with the best dissolving ability was found in LK. E I isolates that 6.71 ppm. Identification biochemistry to test the sensitivity using VITEK® 02 that the selected isolates also can react with various enzymes such as Phosphatase, Glucose, Inulin, D-Mannitol, Esculin hydrolysis and Tetrazolium Red. Based on the sequencing results, 16rRNA LK.E.I isolates identified as *Bacillus Subtilis* with 99% similarity.

Keywords: Phosphate solubilizing bacteria, *Bacillus Subtilis*, Organic Paddy fields

Soil microbes, together with soil organic matter, are essential components in the soil and act as a buffer for soil biology that maintains a balanced supply of nutrients for plants.[1]. Important microbes in paddy fields include N-fixing microbes from the air, P-solubilizing microbes and microbes that can convert S elements into sulfates to be available for plants.[2]. Decomposer microbes need to be added to speed up the decomposition time of organic matter to return it to the land immediately. Utilization of soil microbes to increase and maintain soil fertility in agricultural systems is significant. Microbes' role in the soil includes recycling nutrients and supporting nutrient cycling [3][4].

Phosphate (P) is one of the macronutrients, which is very important for plant growth. Still, its content in plants is lower than nitrogen (N), potassium (K), and calcium (Ca).[5]. In most tropical soils, only 25% of Phosphate given in superphosphate, absorption by plants. Most of 75% is bound to ground [6]. The results show that plants can absorb only 10-30% of the amount of P given. The rest converted into insoluble compounds that are not available to plants. A small part lost through percolation water.[7].

Phosphate Solubilizing Bacteria (PSB) is one of the soil microorganisms that can improve phosphate supply in the soil. Phosphate solubilizing bacteria is decomposer bacteria that consume simple

3. Outoput penelitian tiga

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PARAMETER ANALYSIS OF SOIL PROPERTIES TO DETERMINE THE QUALITY OF PADDY SOIL

Hadija^{1,2*}, Tutik Kuswinanti³, Muhammad Jayadi⁴, Sitti Halima Larekeng⁵

¹Doctoral Program of Agricultural Science, Hasanuddin University Graduate School, Makassar, Indonesia;

²Department of Forestry, Faculty of Agriculture, Moslem University Maros 90512, South Sulawesi Indonesia;

³Department of Plant Pests and Diseases, Faculty of Agriculture Hasanuddin University Makassar 90245, South Sulawesi Indonesia;

⁴Department of Soil Science, Faculty of Agriculture Hasanuddin University Makassar 90245, South Sulawesi Indonesia;

⁵Department of Forestry, Faculty of Forestry, Hasanuddin University Makassar, 90245, South Sulawesi, Indonesia.

*Corresponding Author.

Abstract:

Paddy fields in Indonesia are vulnerable to declining quality due to the high management intensity. This study aimed to determine the factors that influence the quality of paddy fields during the eight years of application of compost in the paddy fields. The study used survey methods and field observations. The results of this study indicate that there are 16 minimum variables of the data set being tested. Tests at a significant level of 0.01 indicate a positive or negative correlation of each parameter of soil properties. The results show five main component variables formed and explain the total data variance of 53.62% in determining the quality of paddy fields. The quality of paddy fields can be explained by the five main components formed. The five variables included are soil biological properties, chemical components, macronutrient components, and micronutrient components. These five main components are factors that affect the quality of paddy fields.

Keywords: *Paddy Soil, soil properties, soil quality,*

3. Outoput penelitian Empat



Soil Function analysis in Determining the Soil Quality Index of Paddy Fields in Salassae Village, Bulkumba Regency, South Sulawesi Province, Indonesia

Hadija¹, T. Kuswinanti², M. Jayadi³, S.T. Larekeng⁴

ABSTRACT

Background: The quality of the function of paddy fields in Indonesia is strongly influenced by the high intensity of the level of management. Degradation of soil quality with improper management practice result in the loss of land resources and functions in the long term.

Methods: This study uses survey methods, and the determination of soil quality index is calculated based on the criteria of Mausbach and Seybold (1993) modified.

Result: This research shows that the overall soil quality at the research location is still quite good. Locations 1,2,3 and 4 indicated a soil quality index with reasonable criteria, while location five indicated a decrease in soil quality index by 0.1% with moderate criteria. The decline in soil quality shown at location five was due to the level of management behavior in giving compost using only local knowledge. The results of this study indicate the main limiting level of soil quality at the research site is the availability of nitrogen and C-organic in the soil.

Key words: Compost management, Paddy field, Soil quality.

INTRODUCTION

In Indonesia, Paddy fields are land with intensive management system. The intensity of intense soil management will significantly affect the function of the soil from a physical, chemical, or biological perspective. The carrying capacity of the soil has many functions,

whereas a provider of ecological services includes maintaining the availability of food production (Li *et al.*, 2020). The function of the soil is very varied, soil quality is the foundation (Laishram *et al.*, 2012). Degradation of soil quality can result in loss of land resources and functions in the long term (Doran and Zeiss, 2000). Therefore, it is necessary to calculate the impact of agricultural management practices (Akinbile and Sangodoyin, 2011).

Soil quality is highly dependent on the interaction of physical, chemical, and biological characteristics and proper soil quality assessment requires the measurement of many parameters (Martunis *et al.*, 2016). Challenges remain in assessing soil quality because the standards set in assessing soil quality vary widely, both spatially and temporally (Liu *et al.*, 2014). The productivity of paddy fields can decrease due to excess and lack of nutrients because the harvest carried more than the nutrients provided through fertilization or the addition of nutrients from irrigation water (Burauel and Baßmann, 2005). The excess of certain fertilizers and the lack of other fertilizers due to imbalanced fertilization and a decrease in soil organic matter content. This degradation threatens rice yields' quantity (productivity) and quality (Seaton *et al.*, 2020).

Determining soil quality is very difficult because soil quality and production are very complex and depend on

¹Doctoral Program of Agricultural Science, Hasanuddin University Graduate School, Makassar, Indonesia.

²Department of Forestry, Faculty of Agriculture, Moslem University, Maros 90512, South Sulawesi, Indonesia.

³Department of Plant Pests and Diseases, Faculty of Agriculture Hasanuddin University, Makassar 90245, South Sulawesi, Indonesia.

⁴Department of Soil Science, Faculty of Agriculture, Hasanuddin University, Makassar 90245, South Sulawesi, Indonesia.

⁵Department of Forestry, Faculty of Forestry, Hasanuddin University, Makassar, 90245, South Sulawesi, Indonesia.

Corresponding Author: M. Jayadi, Department of Soil Science, Faculty of Agriculture Hasanuddin University Makassar 90245, South Sulawesi Indonesia. E-mail: jayadilamuhhas@gmail.com

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complex relationships between soil attributes and other external factors (Yimer, 2022). Soil quality cannot be measured directly, so it is necessary to determine physical, chemical, and biological indicators (Hadija *et al.*, 2018), which will directly provide a comprehensive measurement of soil quality, known as minimum data set (MDS). An MDS with the right indicators can reduce the need to define many indicators (de Lima *et al.*, 2008) and should adequately represent the complete data set (Sarbu and Pop, 2005). Evaluating the status of paddy soil quality at different

3. Outoput penelitian ke lima (Book Chapter)

KEBERLAJUTAN TANAH SAWAH DENGAN PELESTARIAN KERAGAMAN MIKROBA TANAH

Hadija^{1,2*}, Tutik Kuswinanti³, Muhammad Jayadi⁴, Sitti Halima Larekeng⁵

¹[Program Doktor Ilmu Pertanian, Univeritas Hasanuddin, Makassar, Indonesia](#)

²[Program Studi Kehutanan, FAPERTA HUT University Muslim Maros 90512, Sulawesi Selatan, Indonesia](#)

³[Departemen Ilmu Hama dan Penyakit Tumbuhan, Fakultas Pertanian, Universitas Hasanuddin, Makassar 90245, Sulawesi Selatan, Indonesia](#)

⁴[Departemen Ilmu Tanah, Fakultas Pertanian, Universitas Hasanuddin, Makassar 90245, Sulawesi Selatan, Indonesia](#)

⁵[Departemen Kehutanan, Fakultas Kehutanan, Universitas Hasanuddin, Makassar 90245, Sulawesi Selatan, Indonesia](#)

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Formatted: English (US)

E-mail: dhija01@gmail.com

Abstrak: Sistem manajemen pengelolaan lahan sawah sering mengalami eksploitasi hal ini dapat dilihat dari masih sering sistem manajemen pengelolaan lahan kurang tepat dan sehingga terjadi *over exploitation*. Konsekuensi ekologis dari hilangnya keanekaragaman hayati mikroba di tanah sawah terus berlanjut karena intensitas pengelolaan yang cukup tinggi. Padahal terdapat hubungan antara keanekaragaman hayati dan fungsi ekosistem telah muncul sebagai isu sentral dalam ekologi dan ilmu lingkungan selama dekade terakhir. Lingkungan tanah memainkan peran kunci dalam pertumbuhan dan keragaman komunitas mikroba rizosfer, secara langsung dan tidak langsung. Sekresi akar (eksudat) memiliki efek utama pada mikroba tanah sebagai molekul pemberi sinyal bagi mikroba, menciptakan interaksi yang kompleks dan rumit antara tanaman dan mikrobioma. Tujuan penelitian ini adalah untuk mengetahui “keberlanjutan tanah sawah dengan pelestarian keragaman mikroba tanah” dalam rangka pengelolaan tanah sawah lestari dan berkelanjutan. Penelitian ini menggunakan pendekatan kajian pustaka yang meliputi berisi kajian teoritis dengan penelitian-penelitian yang relevan dan mempunyai hubungan erat. Berbagai manfaat yang dapat diperoleh dari terjaganya keaneka ragam mikroba diantaranya, yaitu (1) menyediakan sumber hara bagi tanaman; (2) melindungi akar dari gangguan hama dan penyakit; (3) menstimulir sistem perakaran agar berkembang sempurna memperpanjang usia akar; (4) memacu mitosis jaringan meristem pada titik tumbuh pucuk, kuncup bunga, dan stolon; (5) sebagai penawar racun beberapa logam

CURRICULUM VITAE

A. DATA PRIBADI	:
1. Nama	: Hadija, S.P.,M.P
2. Tempat/tanggal Lahir	: Mandalle, 28 Maret 1982
3. Alamat	: Jl. Berua Raya Perumahan Musdalifa, Sudiang Raya, Makassar
4. Status Sipil	:
a. Nama Suami/Istri	: Margono Hadi Susanto, S.E
b. Nama anak	: Muhammad Ziqri Farras Anindiya Shanum Ramadani

B. Riwayat Pendidikan

a. Pendidikan Formal

Sekolah Dasar Tahun 1988-1994 SD Yapis Serui - Papua

Sekolah Menengah Pertama Tahun 1994-1997 SMP Negeri 2 Serui-Papua

Sekolah Menengah Atas Tahun 1997-2000 SMA Negeri 1 Serui-Papua

Strata 1 (S1) Tahun 2001-2006 di Jurusan Ilmu Tanah, UNHAS

Magister Pertanian Tahun 2011-2013 di Sistem-sitem Pertanian, UNHAS

C. Pekerjaan dan Riwayat Pekerjaan

Pekerjaan : Dosen tetap di Universitas Muslim Maros

NIDN : 0928038201

Pangkat/Jabatan : IIIB/Asisten Ahli

D. Riwayat Penelitian

No	Judul Penelitian	Tahun	Sumber Pendanaan	Posisi dalam Penelitian	Mitra Penelitian
1	Manajemen Peningkatan Kadar Air Tanah Dengan Residu Jerami Padi Pada Sawah Tada Hujan di Kecamatan Mandalle	2017	kemenristek dikti	Peneliti Utama	-
2	Kelimpahan Mikroorganisme Tanah Pasca Penanaman Padi Pada Teknik Pemupukan Yang Berbeda	2018 (Tahap 1)	kemenristek dikti	Peneliti Utama	UNHAS
3	Kelimpahan Mikroorganisme Tanah Pasca Penanaman Padi Pada Teknik Pemupukan	2019 (tahap 2)	kemenristek dikti	Peneliti Utama	UNHAS
4	Sebaran Beberapa Unsur Hara Dan Rekomendasi Pemupukan Spesifik Lokasi Secara Spasial	2019	kemenristek dikti	Anggota Peneliti	-
5	Penggunaan teknik metagenomik untuk penentuan keragaman mikroba tanah sebagai bioindikator kualitas tanah sawah	2021 (hibah Doktor)	kemenristek dikti	Anggota Peneliti	

E. Karya Ilmiah/Artikel Jurnal yang telah dipublikasikan

Simulasi model aquacrop untuk analisis pengelolaan air tanaman padi ladang (2015)

Kajian Postensi Pengembangan Teknologi Sistem Integrasi Tanaman Jagung Dan Ternak Model Zero Waste Di Kabupaten Soppeng (2016)

Manajemen Peningkatan Kadar Air Tanah Dengan Residu Jerami Padi Pada Sawah Tadah Hujan (2017)

klasifikasi Kemampuan Lahan Sawah di DAS Jeneberang Hulu (2017)

The Analysis Of The Pattern Of Aquaculture Business Management Application To Increase The Farmers Income In Pangkep Regency (2017)

The Abundance Of Soil Microorganisms After Planting Rice With Different Fertilization Systems (2018)

Isolation, characterization and identification of nitrogen fixing bacteria with organic fertilizer applications in paddy soil (2020)

F. Makalah Pada Seminar/Konfrensi Ilmiah Nasional dan Internasional

Perubahan Penggunaan Lahan Dan Dampaknya Terhadap Aliran Permukaan Sub Das Tanralili Propinsi Sulawesi (2018)

ISOLASI DAN PENGAMATAN MORFOLOGI KOLONI BAKTERI *Bacillus* Sp DARI TANAH SAWAH DI DESA SALASAE KABUPATEN BULUKUMBA (2020)

Isolation, Characterization And Identification Of Nitrogen Fixing Bacteria With Organic Fertilizer Applications In Paddy Soil (2021)
