Ranu Pani Resort Orchid Diversity Atlas

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Abstract: This research aims to determine the validity of orchid diversity atlas in the Plant Diversity course for Biology Education students. This research was a development research that referred to ADDIE development model which was limited to the stage of Develop phase. The validity of atlas products was obtained from subject matters expert, media expert and field testing. While for practicality, it can be seen from student responses. The results showed the mean results of the subject matter expert validation score was 97.84%, media validation was 98.75%, field testing was 94%, and student responses was 94%. To sum up, this diversity atlas is valid and practical for plant diversity course.

Key Words: orchid diversity atlas, ADDIE development model, plant diversity course

Abstrak: Penelitian ini bertujuan untuk menentukan kevalidan produk atlas keanekaragaman anggrek pada matakuliah Keanekaragaman Tumbuhan untuk mahasiswa Pendidikan Biologi. Jenis penelitian adalah penelitian dan pengembangan yang mennggunakan model pengembangan ADDIE yang dibatasi sampai tahap *Develop*. Kevalidan produk atlas diuji berdasarkan hasil skor validasi dari ahli materi, media, dan praktisi lapangan, sedangkan untuk kepraktisan dapat diuji dari respon mahasiswa. Hasil penelitian menunjukkan rerata hasil skor validasi materi memiliki nilai persentase 97,84%, validasi media 98,75%, praktisi lapangan 94%, dan respon mahasiswa 94%. Simpulan penelitian adalah produk atlas keanekaragaman anggrek valid dan praktis digunakan mahasiswa dalam matakuliah Keanekaragaman Tumbuhan.

Kata kunci: atlas keanekaragaman anggrek, model pengembangan ADDIE, matakuliah keanekaragaman tumbuhan

INTRODUCTION

Education in Indonesia has curriculum as a basic reference. Curriculum compilation by the study program is inseparable with the formulation of course description and learning outcomes. Learning outcomes are used to measure the ability of students in learning activities (Kemenristek, 2016). Learning outcomes can be achieved if learning objectives can be attained through learning activities. The learning process in class is not only educators who is able to deliver the learning materials, but also the process of achieving goals (Sanjaya, 2012). The material delivered through teaching materials is expected to make the learning process more effective so that learning objectives can be achieved. The purpose of the compilation of teaching materials is as additional supplement for students in learning activities and facilitate educators in the implementation of learning (Ministry of National Education, 2009).

One of the mandatory courses that must be taken by Bachelor Degree of Biology Education at Universitas Negeri Malang is Plant Diversity. The learning outcomes in this course are students are able to know the plant nomenclature; know the principles of plant taxonomy which includes description, classification, identification and making identification keys; mastering the principles, concepts and procedures of Biology and applying plant nomenclature in plant structure materials from low to high level plants and being able to analyze them; students are required to be able to explore, collect, and identify and also produce identification keys and herbarium from various plants (Sulasmi, 2016).

Based on the results of need analysis given to 25 Biology education students in 2015, 40% of students stated that they experienced obstacles in subject matter that were difficult to understand, 75% said difficulties in obtaining supportive references, 85% of stu-

dents said teaching materials or reference books were very influential in helping the identification process, 89.5% of students stated the need for supplementary additional teaching materials namely atlas and another teaching materials that could support the identification process, and 91.2% of students expected references that were accompanied by photos with clear information and contained explanations of plant morphology.

The results of interview with lecturers on plant diversity courses obtained information that the teaching material used was in the form of textbooks containing material about orchid plants. In the identification process, students have difficulty in using foreign language books and references that are only narrative without being supported by pictures of plants. This shows that additional teaching materials related to the diversity of orchids are still needed with photos showing clear morphological characteristics and supported by illustration of images of each orchid species to support the learning process.

Atlas of plant can provide an expansion of approaches or studies and clarify the interrelationship of plant morphology (Widodo, 2014). The use of illustrations or pictures help in completing the flora books and key books of determination in supporting the identification process. Atlas is part of spatial data visualization in the form of books that contain images that are integrated with other supporting complete information such as tables, graphics, and text (Setiawan, 2012). Atlas of plant consists of photograph of organisms complete with natural habitats, preserved specimens, and microscopic photos (Wisehart, 2012). Based on Solika's research (2015), Atlas as a mean of identification containing photograph includes habitats, stems, leaves, flowers, fruits and seeds and is equipped with an identification key that helps identification. Fidyah (2016) states that Atlas can be used as a support for theoretically feasible identification based on the results of readability validation and input by Atlas validator.

Bromo Tengger Semeru National Park is a nature reservation area with a diversity of flora and fauna that can be used for research and biodiversity. Bromo Tengger Semeru area which has a high level of orchid diversity is found in Ranu Pani Tourism Park. According to the BromoTengger Semeru National Park Central Data (2014), there are 56 species of orchids in Ranu Pani area. Forest area in Ranu Pani is one of the natural habitats for various species of orchids. Species orchids are rare and highly protected plants. Orchid has characteristic on its flower including beautiful petal leaves with attractive colors and each species has its own uniqueness. Orchids are listed as rare plant and have a higher threat of extinction compared to other species (Vukovic et al., 2011), and therefore it is necessary to re-collect data on orchids using survey and evaluation according to the criteria in the study (Lynam, et al., 2007). The results of the study by Stifkova, et al. (2016) state that the diversity of orchids depends on the diversity of habitats with a range of altitudes calculated.

Research on orchid diversity conducted by Herdiana (2006) states that the diversity of orchids in the TNBTS region is 17 genus and 40 species. The spread and abundance of orchids include *Coelogyne speciosa* and *Pholidota ventricosa*. Research on orchids by Wulanesa (2017) in Coba Trisula Forest of TNBTS states that there are 18 genus and 42 orchid species. The highest distribution of orchids is *Ceologyne miniata* with an INP of 24.45%. Nugroho (2017) said based on the results of an orchid inventory in Gunung Merbabu National Park that was found 18 species of orchids. The Atlas of diversity of orchids which is developed must go through a validation stage with material experts, media and field practitioners so that they can be used in the learning process. The purpose of this study is to determine the validity and practicality of the orchid diversity atlas product in the Plant Diversity course for Biology Education students at Universitas Negeri Malang.

METHOD

This type of research was development research that used the ADDIE development model (Analyze, Design, Development, Implementation, and Evaluation (Branch, 2009). This development research was limited to the Develop stage. At the Analyze stage, the problem was identified by providing need analysis questionnaire to the lecturer and students who have taken plant diversity course; determine the development goals and get solutions to problems, such as by making atlas teaching materials, and preparing what was needed in the development process. Design phase was done by designing an atlas product consisting of several stages namely compiling list of components in the product by preparing research objects, materials, research procedures including the determination of sample points, exploration activities to the identification of orchid plants, format selection, developing product development goals, developing instruments and product trials.

The Develop Phase was the stage of developing atlas products according to the design; choosing supporting media; validating the atlas to the validator; doing formative revision; and conducting small group trials to test readability and obtain student responses to the atlas. The validators in this study were Biology Education lecturers from UM and UMM as material validators and field practitioners with qualifications of having experiences in the field of plants for more than five years. Media expert validators are UM Education Technology (TEP) lecturers with qualifications of more than five years of experience as instructional materials experts. Subjects in this study were 20 undergraduate students of UM Biology Education who had taken Plant Diversity courses. The data collection instrument used a validation sheet and student response questionnaire on the atlas. The data analysis technique results from atlas validation using the percentage score analysis with the formula is as follows.

$$percentage = \frac{\Sigma questionnaire\ assessment\ score}{\Sigma maximum\ score}$$

Remarks:

Σ *questionnaire assessment score* = the number of score answers chosen

Σ *maximum score* = number of questionnaire items x maximum score of questionnaire items

The validity assessment criteria for Atlas material were explained in Table 1. Material in the atlas is considered feasible if it has a validity value of $\geq 90\%$ and is considered very feasible if the validity value is 100%. The criteria for evaluating the validity of the media and field practitioners based on percentage analysis are explained in Table 2. The criteria for evaluating the practicality of the atlas based on responses by students as users of the atlas are explained in Table 3.

RESULTS

The results of this development research are the product of Atlas of Orchid Diversity. Based on the results of the needs analysis, there are several problems such as the difficulty of students in finding complete references in the form of original photographs of species and illustrations showing specifications of plant species, students still have difficulty in studying and identifying orchid plants, the availability of teaching materials that are incomplete with original photographs and illustrations that make students feel difficulties in studying and identifying plants. The solution to the problem is by giving students specific teaching materials to discuss plant subject that is considered difficult to understand as a source of new information. Teaching materials serve as the main source of learning as a complement and enrichment for students (Sanjaya, 2012). Supporting teaching material is atlas. The atlas of plant presents a review of one plant consisting of descriptions, photographs, illustrative pictures to clarify photographs, systematics, abiotic factors and the distribution of these plants. Atlas has a role as medium confirmation for students while practicing, thus they can ensure the truth of the observed results (Perry, 1998). Atlas is useful for the benefit of identification practices in plant systematic learning (Noguchi, 2014).

Ranu Pani Resort TNBTS has the potential for diversity of flora and fauna. One of the flora that has

Table 1. Validity Assessment Criteria

Percentage	Category
90—100	Very valid, can be used and disseminated
80—89	Valid, can be used and disseminated
70—79	Quite valid, can be used and disseminated
60—69	Invalid, can be used and disseminated and
> 60%	need to be partially revised

(Source: Modified from Sudjana, 2012)

Table 2. Criteria for Evaluation of Media Validity and Education Practitioners

Percentage	Category
85—100	Very valid, can be used without revision
70—85	Quite valid, can be used and needs revision
50—70	Invalid, cannot be used and needs major revision
1—50	Invalid, cannot be used and needs total revision.

(Source: Modified from Akbar, 2013).

Table 3. Criteria for Evaluating Responses by Students

Percentage	Remarks
86,00—100,00	Very practical to use and disseminate
76,00—85,00	Practical to use and disseminate
60,00—75,00	Practical enough to use and disseminate
55,00—59,00	Not practical to use and disseminate, need minor revisions
00,00—54,00	Not practical to use and disseminate, needs major revision

(Source: Modified from Purwanto, 2013)

conservation value and high diversity is orchid. Orchid exploration was carried out using dependent investigation method which means to explore the area that has been determined by limits of power, time, terrain, and safety factors to find the diversity of orchid plants. Orchid identification was conducted at the LIPI Cibinong Biology Research Center and TNBTS Center. The types of orchids which were found and identified as many as 17 genus and 25 species of orchids that grow epiphytically or terrestrial.

The specifications of Ranu Pani TNBTS orchid diversity atlas are as follows:

First, Has a section, namely Chapter I Study of Bromo Tengger Semeru National Park, Chapter II Introduction to Orchid Plants, Chapter III Stages of Exploration, Collection, Description, and Identification Activities, Chapter IV Orchid Diversity in Ranu Pani, TNBTS.

Second, Atlas contains the results of relevant research conducted by researchers related to the potential diversity of orchids in Ranu Pani TNBTS region. Orchid photos taken using a professional DSLR camera that are supported by macro lens and telephoto lens to get clear photos. The photo-taking technique must focus on the object by using the flash to get a clear and focused photo of the orchid.

Third, Atlas can be used classically or independently, making it easier for lecturers and students to carry out identification activities.

Material Expert Validation

The results of the atlas validation by material experts indicated that the aspect of atlas presentation was obtained with a percentage value of 97.89 (Table 4). The result showed a very high category, so that the orchid plant atlas was suitable to be used as teaching material. The next aspect was the aspect of content eligibility obtained in the percentage value of 97.14. These results were interpreted by the decision that the atlas was appropriate to use, therefore there

was no need for revision. The next aspect was the aspect of the quality of the photos obtained which had a percentage value of 100, was interpreted very high and did not need revision. The final decision from the validation of the material expert had a percentage of 97.84, thus the material on the orchid plant atlas was suitable to be used. The results of the validation by the material experts were as follows.

In general, atlases were said to be valid, feasible, and can be continued to the next stage of research. Material expert validators provided responses and suggestions, including (1) writing arrangements adapted to the format, (2) layout consultations with media experts, (3) Chapter Identification procedures are elaborated in more detail, (4) change of boundaries between chapters, and (5) advice for orchid atlas products on IPR.

Figure 2 shows the results of the revision based on the advice of the material expert validator. Material expert validators provided advice on replacing images on the book separator pages between chapters.

Media Expert Validation

Based on the results of the validation of media experts, it was known that the aspects of the atlas format were obtained a percentage value of 100. The acquisition showed a very valid category, so that the Orchid Plant Atlas was suitable to be used as teaching material. The next aspect was the atlas skin design aspect which was obtained a percentage value of 100. These results were interpreted by decision that was feasible to be used, therefore there was no need for revision. The next aspect was the design aspect of the contents of the atlas which obtained a percentage of 97.65, meaning very valid and did not need revision. The next aspect was the photo quality aspect which was obtained as a 100 percentage value, which was interpreted as very valid and did not need to be revised. The final decision on the results of the media expert validation had a percentage of 98.75, so that

Table 4. Analysis of Material Expert Validation

No.	Aspect	Indicator/ Descriptor	Maximum score	Validation score	P (%)	Qualification
1.	Content presentation	19	95	93	97,89	Very valid
2.	Content eligibility	14	70	68	97,14	Very valid
3.	Photo quality	4	20	20	100	Very valid
	TOTAL	37	185	181	97,84	Very valid

Figure 2. Results of Image Revision on Partial Pages between Chapters

from the aspect of the media, the product de-velopment of the orchid atlas was feasible to use (Table 5). Media expert validators provided responses and suggestions, such as correcting the background color of the cover and the color of the writing, thus it was clearly legible. The results of the atlas revision based on the media validator's suggestion are shown in Figure 3.

Field Practitioner Validation

The results of the field practitioners' validation showed that the aspect of the suitability of the atlas with the principle of developing teaching materials earned a percentage value of 100. The acquisition

showed a very valid category, so that the Orchid Plant Atlas was suitable to be used as teaching material. The next aspect was the aspect of content eligibility, obtaining a percentage of 94.28. These results were interpreted by a decision that was feasible to be used, thus there was no need for revision. The next aspect was the aspect of photo quality which obtained a per-centage of 90, had a high meaning and did not need revision. The final decision of the results of field prac-titioner validation had a percentage value of 94, there-fore the product development of the orchid atlas was feasible to be used (Table 6).

The field practitioner validator gave the following responses and suggestions: 1) writing the scientific

Table 5. Media Expert Validation Summary

No.	Aspect	Indicator/Descriptor	Maximum score	Validation score	P (%)	Qualification
1.	Atlas format	2	10	10	100	Very valid
2.	Atlas skin design	9	45	45	100	Very valid
3.	Design the contents of the atlas	17	85	83	97,65	Very valid
4.	Photo quality	4	20	20	100	Very valid
	TOTAL	32	160	158	98,75	Very valid

Figure 3. Cover Revision

Table 6. Field Practitioner Validation

No.	Aspect	Indicator/ Descriptor	Maximum score	Validation score	P (%)	Qualification
1.	The suitability of the atlas with the principle of instructional materials	2	10	10	100	Very valid
2.	Content eligibility	14	70	66	94,28	Very valid
3.	Photo quality	4	20	18	90	Very valid

name followed by author, 2) incorrect writing on several atlases, 3) giving information on the illustration of orchids, 4) adding description to each orchid species found, 5) writing the initials in each picture, 6) Revising the writing of the elevation place. The results of the revision are shown in Figure 4.

The readability test results in small groups showed that the percentage of language by 92 which indicated the language used in the atlas was very easy to understand, the readability percentage of 94.7 showed the use of letters and the size of the writing on the atlas was easily understood, the percentage of content worthiness of 93.6 indicated the feasibility content in accordance with the material discussion of orchid plants, the percentage of usefulness of the atlas 94 showed that the atlas was very useful in the learning process, the percentage of photo quality in the 95 atlas indicates that the photo was good and clear to understand (Table 7).

According to the students, the atlas is interesting since there are colorful and focused orchid photos,

writing and language in the atlas is easy to understand in studying and identifying orchid plants. Students give suggestions regarding the product diversity atlas of orchids related to close-up photos and resolution that should be increased in order to be clearer.

DISCUSSION

The teaching material product developed is atlas of orchid's diversity in Ranu Pani TNBTS. Atlas is a collection of photos and complete illustrations supported by descriptions on each plant species. Atlas of plant has a function as a means of identifying plants in taxonomy and systematics. Making and updating the design of the flora atlas needs to be done by adopting current visual and computer technology (Widodo, 2014).

Atlas was developed based on ADDIE development model and only to the Develop stage. The material in atlas was developed based on the results of research and related references. Atlas included the
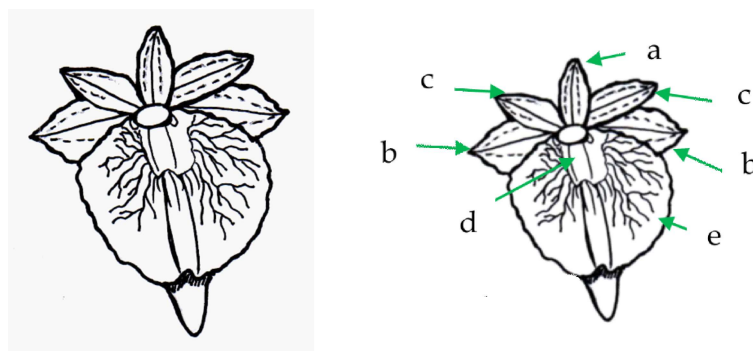
Figure 4. Results of revisions to Hand Drawings of Orchid Morphology

Table 7. Average Summary of Practical Test

No.	Aspect	Indicator/ Descriptor	Maximum score	Validation score	P (%)	Qualification
1.	Language	2	200	184	92	Very Practical
2.	Legibility	3	300	284	94,7	Very Practical
3.	Content eligibility	14	1400	1311	93,6	Very Practical
4.	Benefits of the atlas	4	400	379	94	Very Practical
5.	Photo quality	4	400	380	95	Very Practical
	TOTAL	27	2700	2538	94	Very Practical

beginning, content and concluding parts. The initial part of the developed orchid diversity atlas contained a front cover titled the orchid diversity atlas in Ranu Pani TNBTS, foreword, preface, table of contents, table list, and figures. The contents section contained Chapter I Study of Bromo Tengger Semeru National Park (general profile, topography and climate, diversity of flora and fauna of TNBTS, and introduction to Ranu Pani), Chapter II Introduction to Orchid Plants (morphological features of orchid plants from roots, stems, leaves and flowers), Chapter III Stages of Exploration, Collection, Description and Identification Activities, Chapter IV Orchid Diversity in Ranu Pani TNBTS Resort area (results of identification and description of orchids for each species). The concluding section contained a glossary, bibliography, author biography and back cover page.

The atlas product that has been developed was carried out by the validation stage by the material validator, the media and field practitioners, as well as the practicality phase. The assessment criteria were adapted from Sudjana (2012), Akbar (2013), and Purwanto (2013). The mean percentage of validation by material experts was 97.84, media experts was 98.75, and the results of validation by field practitioners was 94. The percentage results indicate that the orchid plant atlas was valid and suitable for use. Atlas practicality test results for students of Biology Education S1 class of 2015 is 94% which showed that students gave a positive response and stated that the atlas developed was very practical to be used in these learning activities.

The strength of the developed atlas is that it presents research-based data. The Atlas contains information about Bromo Tengger Semeru National Park, orchid morphological features, and orchid descriptions including orchid photos, illustrated stature, orchid flowers and leaves, abiotic factors, and systematics. This is new information and there is no orchid atlas developed by other researchers in Ranu Pani TNBTS. This atlas can be used by students as a means of identification and makes it easier for students to understand the morphological characteristics of orchid species. Atlas can be used in classical learning activities or outside the classroom independently.

CONCLUSION

The results showed the average results of the material validation score with a percentage of 97.84, media validation 98.75, field practitioners 94, and student responses 94. The results of the validation by the experts showed that the developed orchid atlas had a very valid category for students use and the small group readability test for the atlas was very good and practical to be used. Suggestions that need to be considered include the diversity of orchids atlas should be is-sued through the issuing agency, further development should be carried out until the stage of implementation in class to determine the effectiveness of the products that have been developed.

REFERENCES

Akbar, S. (2013). *Instrumen Perangkat Pembelajaran*. Bandung, Indonesia: PT. Remaja Rosdakarya.

Balai Besar TNBTS. (2014). *Rencana Pengolahan Jangka Panjang Taman Nasional Bromo Tengger Semeru Kabupaten Malang, Pasuruan, Probolinggo, dan Lumajang Provinsi Jawa Timur.* Malang, Indonesia: Kementerian Kehutanan Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam.

Branch, R. M. (2009). *Instructional Design: The ADDIE Approach*. New York, USA: Springer.

Departemen Pendidikan Nasional. (2009). *Pedoman Umum Pemilihan dan Pemanfaatan Bahan Ajar*. Jakarta, Indonesia: Direktorat Jenderal Pendidikan Dasar dan Menengah Umum.

Direktorat Pembelajaran dan Kemahasiswaan. (2014). *Buku Kurikulum Pendidikan Tinggi*. Jakarta, Indonesia: Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan.

Direktorat Pembelajaran dan Kemahasiswaan. (2014). *Panduan Penyusunan Capaian Pembelajaran Lulusan Program Studi*. Jakarta, Indonesia: Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan.

Fidyah, A.I. (2016). Pengembangan Atlas Flora Paku-Pakuan sebagai Sarana Identifikasi. *Jurnal BioEdu*, *5*(3), 1–7.

Herdiana, Nanang. (2006). Keragaman Jenis Anggrek Epifit di Blok Ireng-Ireng Taman Nasional Bromo Tengger Semeru. *Jurnal Penelitian Hutan dan Konservasi Alam*, *3*(5), 575–583.

Kemenristek PT. (2016). *Panduan Penyusunan Kurikulum Pendidikan Tinggi*. Jakarta, Indonesia: Direktorat Jenderal Pembelajaran dan Kemahasiswaan Direktorat Pembelajaran.

Lynam, T., Jong, W., Sheil, D., Kusumanto, T., & Evans, K. (2007). A Review of Tools for Incorporating Community Knowledge, Preferences, and Values into Decision Making in Natural Resources Management. *Journal Ecology and Society*, *12*(1), 5–10.

Nugroho, G.D., Aditya., Dewi, Kristina., & Suratman. (2017). Keanekaragaman Anggrek (Orchidaceae) di Taman Nasional Gunung Merbabu (TNGMb), Jawa Tengah. *Prosiding Semnas Masyarakat Biodiverisitas Indonesia*, *4*(2), 195–201. doi: 10.13057/psnmbi/m040217.

Noguchi, T. (2014). *Atlas of Plant Cell Structure*. New York, USA: Springer.

Paidi. (2008). *Pengembangan Perangkat Pembelajaran Biologi yang Mengimplementasikan PBL dan Model Metakognitif serta Efektivitasnya terhadap Kemampuan Metakognitif, Pemecahan Masalah, dan Penguasaan Konsep Biologi SMA di Sleman-Yogyakarta* (Unpublished doctoral dissertation). Universitas Negeri Malang, Indonesia.

Perry, J.W., & David, M. (1998). *Photo Atlas for Botany*. USA: Wadsworth Publishing Company.

Purwanto, N. (2013). *Prinsip-Prinsip dan Teknik Evaluasi Pengajaran*. Bandung, Indonesia: PT. Remaja Rosdakarya .

Sanjaya, W. (2012). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Jakarta, Indonesia: Kencana Prenada Media Group.

Setiawan, I. (2012). *Teknologi Digital untuk Mendukung Atlas*. (Makalah diterbitkan), Jakarta, Indonesia.

Solika, M. (2015). Pengembangan Atlas Keanekaragaman Tumbuhan: Fabales, Apocynales, dan Magnoliales sebagai Sarana Identifikasi. *Jurnal BioEdu, 4*(3), 927–931.

Stipkova, Z., Traxmandlova, I., & Kindlmann, P. (2016). Determinants Of Orchid Species Diversity in Latin America. *Journal Lankesteriana, 16*(2), 293–297.

Sulasmi, E.S., Sunarmi., Mahanal, S., & Wijayanto, A. (2016). *Rencana Perkuliahan Semester Mata Kuliah Keanekaragaman Tumbuhan FMIPA UM Semester Genap 2015/ 2016*. Malang, Indonesia: Universitas Negeri Malang.

Vukovic, N., Brana, S., & Mitic, B. (2011). Orchid diversity of the cape of Kamenjak (Istria, Croatia). *Journal Acta Bot Croat, 70*(1), 23–40.

Wulanesa, W.O.S., Soegianto, A., & Basuki, Nur. (2017). Eksplorasi dan Karakterisasi Anggrek Epifit di Hutan Coban Trisula Kawasan Taman Nasional Bromo Tengger Semeru. *Jurnal Produksi Tanaman*, *5*(1), 125–131.

Widodo. (2014). *Karakteristik Morfo-Anatomi dan Kimiwi Spesies Cosmostigma Racemosum (Asclepiadoidea) dan Pengembangan Atlas Struktur Morfologi Anatomi serta Kimiawinya*. (Unpublished doctoral dissertation). Universitas Negeri Malang, Indonesia.

Wisehart, G.D., Rempala, E.C. & Leboffe, M.J. (2012). *A Photographic Atlas of Marine Biology*. USA: Morton Publishing.