Data Paper

Takeshi INOUE, Masaki UCHIDA, Masakane INOUE, Ryo KANEKO, Sakae KUDOH, Yoshinori MINAMI and Hiroshi KANDA. Vegetation data of high Arctic lichens on Austre Brøggerbreen glacier foreland, Ny-Ålesund, Svalbard, in 1994. Polar Data Journal. 2019, 3, p. 1–11. https://doi.org/10.20575/00000005

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1st submission

Editor Start Date: 8/21/2018

Editor Stop Date: 10/1/2018

Reviewer #1 (8/29/2018–9/6/2018)

Reviewer #2 (11/29/2018–11/30/2018)

Editor Comments to the Author:

Reviewer #1 : anonymous

This manuscript reports the metadata (species, dates and locations) of the herbarium lichen specimens collected from a Spitzbergen glacier. Frequency of occurrences (in 5 quadrats at each site) and land coverage (%) are also reported along with the metadata.

This dataset comprises an important part of Polar vegetation data and provides a useful guide to those who wishes to conduct literature survey of lichen biogeography, as well as field study on lichen ecology.

And, English writing is immature and should be edited by a native speaker (in the field of science) or a professional editor (or a editing company).

On the other hand, this manuscript is still immature and should be revised before qualification for publication.

Shortages and immaturities are listed below.

******* Please provide “line numbers” from next submission. *******

General. Locations of 55 sample collection sites (i.e., the sites listed in Tables 2 and 3) should be not only given by GPS positions but also by pointing on a map, preferably on a topographic map.

Line 7. “Midori-Cho, Tachikawa-shi”. Is “Cho” to be non-capitalized, or is “shi” to be capitalized?

Abstract. “microphotography and composition of lichens”.

1. Background & Summary. “Appearance and coverage of … were high”.

- Does “appearance” mean to indicate “occurrence” that is defined as the number of “lichen-occurring quadrats” per 5 quadrats at a site? If so, please describe so.
- Please provide here the quantitative definition of “coverage”.
- What is the logical bases (e.g., literature citations) to conclude “high”?

2. Study Site. “Between 2001 and 2008”.

Please describe the relationship between the “2001-2008 site(s)” and the “1994 sites”. Are they located at the same location(s), or just nearby locations?

3. Methods.

3.1. Vegetation survey

- “Observation site provide by …”. Please check grammatical correctness.
- “… settled respectively.” Please check grammatical and vocabulary correctness.”
- “lichen specimens were collected from all quadrats …” Judged from Table 2, lichens were not necessarily found and collected from all quadrats. Please refine the statement.
- “Also, microlichens … assumed 0.25% per one quadrat.” Please check grammatical correctness; and, please make it sure that “0.25%” accounts an area coverage by one microlichen or by all the microlichens (per quadrat) collectively.
- “Approximately 300 lichen specimens had been collected in 1994.” The total number of quadrats is 275, based on 5 quadrats per site and a total 55sites (20 + 28 + 7 sites). Then, about 300 lichens were collected from a total of 275 quadrats; do I correctly interpret?
- If available, please provide data about percentages of the “collected lichens” against the “all occurring lichens” in a quadrat. The data may not necessarily be perfectly comprehensive; only partial data are informative.

3.2. Identification of lichens

- “The specimens were brought back to Japan …” The specimens originated in Spitzbergen and thus were not “back to Japan”, logically. It was the Japanese researchers that got “back to Japan”!
- “Chemical analyses … using … (TLC) and color reactions …” The results of the chemical analyses are not seen. In which part of the manuscript, are the data presented? Please clearly state in the main body of the manuscript.

3.3. Observation point

- All the writing of this section should be refined and edited by professionals.
- Please clarify that the locations were determined solely by GPS or with other means.

Table captions Table 1.

- Please provide the captions for “Table 1a” and “Table 1b”, respectively, too.

Table captions Table 2

- All the writing of this caption should be refined and edited by professionals.
- The word “appearance” may better be replaced with “occurrence”.

Table 2

- “H. kanda and T. Inoue”; “kanda” should be capitalized as “Kanda”.
- As to the GPS positionings, for example, “78.93021°N”, the 5th decimal place (in this case “…1°N”) corresponds to about a 1 m scale, based on a 1° = 111.11… km and a 0.00001° ≈ 111 km/100,000 = 111 m/100 = 1.11 m. I’m not quite sure whether the GPS accuracy in the Polar regions in 1994 was at the level of 1 m or not (probably at a >10-m accuracy). Please clarify this point.

Reviewer #2 : anonymous

This manuscript lists the names and occurrence of lichens on a high-arctic glacier foreland. The data seem original and are suitable for publication in Polar Data Journal, but the manuscript is generally very poorly organized with many unclear descriptions. The authors need to carefully revise the manuscript by themselves.

What was the year of survey? It was 1994 in the title and abstract, but it was between 2001 and 2008 according to the study site.

What was the number of species? It is approximately 82 species in the Abstract; specify the exact number of species recorded, or explain what taxa were recorded including unidentifid species or genus. The manuscript is very confusing, as the number of species is 83 in Table 1, but 87 in Tables 2 and 3.

How many specimens did you get? Avoid stating 'about 300 specimens' and specify the exact number of specimens handled.

What do you mean by 'approximately 10% of the lichen species' in Background & Summary? Which number of species with respect to what number? Were all the taxa you found listed previously? Did you find species new to the region or previous catalogs in that particular region? If so, simple division does not make sense.

Were the original data already published or not? The dataset can provide useful implications for the ecology of lichens on the glacier foreland because it contains many ecological metadata. If published, then refer to that paper and summarize major findings. If not yet published, the authors may consider performing ecological analyses and publish as an ecological paper, with the original data attached as an appendix.

The Methods section is generally unsatisfactory and needs thorough revisions.

What is your 'appearance'? Define this index and explain why the maximum value for this is 5.

What is your 'coverage'? Coverage of lichen relative to what?

What is 'microlichens'? Which species are microlichens?

I do not understand the sentence 'Also, micolichens that have ...'. Rephrase the sentence. What index should be 0.25%?

Specify 'approximately 300 specimens'.

Provide the magnification used for microscopic observations.

I cannot find the data of TLC and color reactions.

State in the figure legend what are 1a and 1b.

Average coverage for five replicates in Table 3?

The manuscript should be resubmitted after being proofread by a colleague who is a native speaker of English and is an expert of lichen.

Authors Response:

To Reviewer #1

To Reviewer #2

Thank you very much for your comments. We studied your comments carefully and have corrected our manuscript according to the following comments.

1. What was the year of survey? It was 1994 in the title and abstract, but it was between 2001 and 2008 according to the study site.

Answer: We carried out lichen vegetation survey in the summer of 1994, to avoid confusing study period, we showed climate data in the same year (1994). (Lines 37–40)

2. What was the number of species? It is approximately 82 species in the Abstract; specify the exact number of species recorded, or explain what taxa were recorded including unidentified species or genus. The manuscript is very confusing, as the number of species is 83 in Table 1, but 87 in Tables 2 and 3.

Answer: I am very sorry for the confusion. To clarify number of species, we have deleted lichen species which we could not identify species level (We identified genus level.). Therefore, present data shows species level identification. Total number of the lichen species which we have collected from the study site was 82 species. Then we list 82 species on the manuscript and tables. (Line 14, 23 and tables).

3. How many specimens did you get? Avoid stating 'about 300 specimens' and specify the exact number of specimens handled.

Answer: We collected 1,630 specimens and we have input the information on the manuscript. (Line 51)

4. What do you mean by 'approximately 10% of the lichen species' in Background & Summary? Which number of species with respect to what number? Were all the taxa you found listed previously? Did you find species new to the region or previous catalogs in that particular region? If so, simple division does not make sense.

Answer: To avoid confusion and incorrect expressions, we cited lichen flora information published by Øvstedal et al. (2009). However, we found one species which doesn't be listed on the flora list, we cited Inoue et al. (2011) because they found the species near Ny-Ålesund. (Lines 22–26)

5. Were the original data already published or not? The dataset can provide useful implications for the ecology of lichens on the glacier foreland because it contains many ecological metadata. If published, then refer to that paper and summarize major findings. If not yet published, the authors may consider performing ecological analyses and publish as an ecological paper, with the original data attached as an appendix.

Answer: Thank you very much for your suggestion. We have already reported about a new species to Svalbald to investigate using these specimens. However, we have not published these data. We plan to submit a paper using this data after analyzing from ecological point of view in the future.

6. What is your 'appearance'? Define this index and explain why the maximum value for this is 5.

Answer: Since it seems to be difficult to understand 'appearance' intuitively, we identified appearance as rate (%). We set 98 plots and conducted the vegetation survey at five quadrate in each plot. We showed appearance per plot according to the equation 1 on the manuscript. (Lines 56–58).

7. What is your 'coverage'? Coverage of lichen relative to what?

Answer: We have investigated coverage in each species for each quadrat. Then basic coverage data is quadrat level. However, we set 98 plots. Therefore we defined coverage is average of coverage values at five quadrats. (Lines 62–67).

8. What is 'microlichens'? Which species are microlichens?

Answer: Since the word 'microlichens' could cause confusing, we have deleted the word 'microlichens' from the manuscript.

9. I do not understand the sentence 'Also, micolichens that have ...'. Rephrase the sentence. What index should be 0.25%?

Answer: According to the referee's indication, we don't use the value "0.25" and it is hard for us to quantification because of the coverages were very small, we did not consider the coverage to determine average coverage per each plot. Therefore data was changed at 0.25 to zero for Table_S4 on data supplement.

10. Specify 'approximately 300 specimens'.

Answer: According to the referee's indication, we cited one flora paper and input actual number (748 species) on the manuscript. (Line 22)

11. Provide the magnification used for microscopic observations.

Answer: According to the referee's suggestion, we have added the magnification used for microscopic observations on the manuscript. (Lines 73–74).

12. I cannot find the data of TLC and color reactions.

Answer: Yes, we did not show the data of TLC color reactions because of huge data and the data used for the species identification. Of course the data have to show when we submit new species to a scientific paper. If referee strongly suggest to show the data of TLC, we prepare the data.

13. State in the figure legend what are 1a and 1b.

Answer: According to the referee's indication, we sum up just 1. (Table S1)

14. Average coverage for five replicates in Table 3?

Answer: Yes, we set five quadrats per each plot. We calculated average coverage to determine plot level coverage.

15. The manuscript should be resubmitted after being proofread by a colleague who is a native speaker of English and is an expert of lichen.

Answer: Thank you very much for the suggestion. Unfortunately, we don't know native expert of lichen taxonomist. Therefore, we have requested English proof company to check our manuscript.

2nd submission

Editor Start Date: 8/21/2018

Editor Stop Date: 10/1/2018

Reviewer #1 (11/29/2018–11/30/2018)

Reviewer #2 (11/29/2018–12/19/2018)

Editor Comments to the Author:

Reviewer #1 : anonymous

The manuscript was revised in response to my previous comments; however, the previous comments were not cited in their original words/phrases/sentences but were transformed with the authors' interpretation. Please try to honestly cite the original comments, and then, respond to the comments in the one-by-one manner.

For example, the "General" comment was not responded, i.e., accepted or rebutted: General. Locations of 55 sample collection sites (*i.e.*, the sites listed in Tables 2 and 3) should be not only given by GPS positions but also by pointing on a map, preferably on a topographic map.

I will review the revised manuscript only after receiving the "honest and simple list of the authors' responses to my previous comments (re-listed below).

General. Locations of 55 sample collection sites (*i.e.*, the sites listed in Tables 2 and 3) should be not only given by GPS positions but also by pointing on a map, preferably on a topographic map.

Abstract. "microphotography and composition of lichens".

1. Background & Summary. "Appearance and coverage of … were high".

- Does "appearance" mean to indicate "occurrence" that is defined as the number of "lichen-occurring quadrats" per 5 quadrats at a site? If so, please describe so.
- Please provide here the quantitative definition of "coverage".
- What is the logical bases (*e.g.*, literature citations) to conclude "high"?

2. Study Site. "Between 2001 and 2008".

Please describe the relationship between the "2001-2008 site(s)" and the "1994 sites". Are they located at the same location(s), or just nearby locations?

3. Methods.

3.1. Vegetation survey

- "Observation site provide by …". Please check grammatical correctness.

- "… settled respectively." Please check grammatical and vocabulary correctness."
- "lichen specimens were collected from all quadrats …" Judged from Table 2, lichens were not necessarily found and collected from all quadrats. Please refine the statement.
- "Also, microlichens … assumed 0.25% per one quadrat." Please check grammatical correctness; and, please make it sure that "0.25%" accounts an area coverage by one microlichen or by all the microlichens (per quadrat) collectively.
- "Approximately 300 lichen specimens had been collected in 1994." The total number of quadrats is 275, based on 5 quadrats per site and a total 55sites (20 + 28 + 7 sites). Then, about 300 lichens were collected from a total of 275 quadrats; do I correctly interpret?
- If available, please provide data about percentages of the "collected lichens" against the "all occurring lichens" in a quadrat. The data may not necessarily be perfectly comprehensive; only partial data are informative.

3.2. Identification of lichens

- "The specimens were brought back to Japan …" The specimens originated in Spitzbergen and thus were not "back to Japan", logically. It was the Japanese researchers that got "back to Japan"!
- "Chemical analyses … using … (TLC) and color reactions …" The results of the chemical analyses are not seen. In which part of the manuscript, are the data presented? Please clearly state in the main body of the manuscript.

3.3. Observation point

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Table captions Table 1.

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Table 2

- "H. kanda and T. Inoue"; "kanda" should be capitalized as "Kanda".
- As to the GPS positionings, for example, "78.93021°N", the 5th decimal place (in this case "…1°N") corresponds to about a 1 m scale, based on a 1° = 111.11… km and a 0.00001° ≈ 111 km/100,000 = 111 m/100 = 1.11 m. I'm not quite sure whether the GPS accuracy in the Polar regions in 1994 was at the level of 1 m or not (probably at a >10-m accuracy). Please clarify this point.

Reviewer #2 : anonymous

The authors carefully revised the manuscript. I have a few additional minor comments that the authors should be clarified.

L45. What was your 'plot'? How many 'transects' in each plot? You had 105 (=45+24+29+7) plots but only 98 plots (L50)?

L49. Five quadrats at a 5-m interval should give a 20-m transect.

Authors Response:

To Reviewer #1

I'm Masaki Uchida of co-author of this manuscript. I apologize deeply about not replying to your comments when we submitted a revised manuscript. I don't know why but Dr. Takeshi Inoue who is the responsible author of this manuscript could not download your comments. Therefore, we didn't consider your comments on last revised manuscript and response letter. I got your comments from the editorial office of the Polar Data Journal. Then I (We) reply to your comments as follows.

General. Locations of 55 sample collection sites (*i.e.*, the sites listed in Tables 2 and 3) should be not only given by GPS positions but also by pointing on a map, preferably on a topographic map.

Answer: We accept the reviewer's criticism concerning sample collection sites. At first, we use "plot" in each line transect. Since it is complex to use original plot ID for sampling sites, we added plot number in addition to plot ID. We made a map which including sampling plot number. (Table S2 and Figure 1).

Line 7. "Midori-Cho, Tachikawa-shi". Is "Cho" to be non-capitalized, or is "shi" to be capitalized?

Answer: We appreciate the reviewer indication. We revised into "cho."

Abstract. "microphotography and composition of lichens".

Answer: I'm not sure but if I correctly understand the reviewer's indication, we investigated "microtopography." (Line 15)

1. Background & Summary. "Appearance and coverage of … were high".

- Does "appearance" mean to indicate "occurrence" that is defined as the number of "lichen-occurring quadrats" per 5 quadrats at a site? If so, please describe so.

Answer: In accordance with the reviewer's suggestion, we have changed the word "appearance" to "occurrence". (Lines 13, 27, 54, 55, 59, 60, and tables 1 and S3). At the same time, we have changed abbreviation from "*LA*" to "*LO*" and "*A*" to "*O*" in the equation 1. (Lines 54 - 58)

- Please provide here the quantitative definition of “coverage”.

Answer: Thank you for the indication. Since “coverage” may be difficult because of technical term of plant ecology. We have changed the words from “coverage” to “cover”. (Lines 13, 63 – 65, 68 and Table S4) We stated about the coverage as “percentage cover of lichen by species in each plot” (Line 61). We think that the sentence defined quantitatively the cover of lichen.

- What is the logical bases (*e.g.*, literature citations) to conclude “high”?

Answer: Although there is some information between microhabitat and number of lichen species (e.g. Williams et al., 1978, Vegetation and production ecology of an Alaskan Arctic Tundra. p.185-206). It is difficult to compare those data because of methodological differences. Then, we just summarized our own data. However, we have added "may" because no data is supporting logical bases.

2. Study Site. “Between 2001 and 2008”.

Please describe the relationship between the “2001-2008 site(s)” and the “1994 sites”. Are they located at the same location(s), or just nearby locations?

Answer: The description "2001-2008 site" has been deleted because of other reviewer's indication. Instead, we stated annual mean air temperature and precipitation in 1994. The nearest distance between the weather station and a sampling plot is about 1 km.

3. Methods.

3.1. Vegetation survey

- “Observation site provide by …”. Please check grammatical correctness.

Answer: We have revised explanation about vegetation survey and English proofreading company has checked our manuscript. To avoid confusion, we have deleted three lichens from the catalog of lichen species (Table S1) because we couldn’t identify species level (We identified genera level.). (Lines 14, 24, Table S1) Other important point is as follows,

1. Number of plots.

Since there was a mistake for sampling plot number, we have accurately corrected. (Lines 46-47, 51).

2. Explanation of vegetation survey.

Since we set a 20-m line transect in each sampling plot and also set five quadrats (30 cm x 30 cm) every five-meter, we have added the information on the manuscript. (Lines 50-52)

3. Table 1

Since we didn’t show any data on the manuscript, we made Table 1 which shows major lichen species in our study site.

- "… settled respectively." Please check grammatical and vocabulary correctness."

Answer: According to the reviewer's suggestion, we have modified the indicated part and English proofreading company has checked the sentence. (Lines 45-47).

- "lichen specimens were collected from all quadrats …" Judged from Table 2, lichens were not necessarily found and collected from all .". Please refine the statement.

Answer: According to the reviewer's suggestion, we have modified the statement. (Line 52).

- "Also, microlichens … assumed 0.25% per one quadrat." Please check grammatical correctness; and, please make it sure that "0.25%" accounts an area coverage by one microlichen or by all the microlichens (per quadrat) collectively.

Answer: According to another reviewer's indication, we don't use the assumption ("0.25"). Then the cover of lichen of 0.25% was considered as 0%.

- "Approximately 300 lichen specimens had been collected in 1994." The total number of quadrats is 275, based on 5 quadrats per site and a total 55sites (20 + 28 + 7 sites). Then, about 300 lichens were collected from a total of 275 quadrats; do I correctly interpret?

Answer: We have rechecked number of sampling plot and quadrat. Number of sampling plot consist of the ridge (R; 42 plots), slope (S; 20 plots), and wetland (W; 29 plots), and also recorded the gravel/boulder surface texture (GB, 7 plots). Then the total sampling plot is 42+20+29+7=98. Since we set five quadrats in each sampling plot, the number of quadrat is 98 x 5 = 490. (Lines 46-47, 51-52)

- If available, please provide data about percentages of the "collected lichens" against the "all occurring lichens" in a quadrat. The data may not necessarily be perfectly comprehensive; only partial data are informative.

Answer: Thank you very much for the suggestion. Although we don't consider the cover of lichen under 1%, we have listed all lichen species on Table S1 and S4.

3.2. Identification of lichens

- "The specimens were brought back to Japan …" The specimens originated in Spitzbergen and thus were not "back to Japan", logically. It was the Japanese researchers that got "back to Japan"!

Answer: We have changed the sentence as follows, "We brought the specimens to Japan". (Line 72)

- "Chemical analyses … using … (TLC) and color reactions …" The results of the chemical analyses are not seen. In which part of the manuscript, are the data presented? Please clearly state in the main body of the manuscript.

Answer: We did not show the data of TLC color reactions because of huge data and the data used for the species identification. Of course the data have to show when we submit new species to a scientific paper.

3.3. Observation point

- All the writing of this section should be refined and edited by professionals.

Answer: Since we had . indication from another reviewer, Edanz editing company has checked our manuscript and all table captions. We have added that on the Acknowledgments section.

- Please clarify that the locations were determined solely by GPS or with other means.

Answer: We used the website “TopoSvalbard”7 (Table S2) to determine the GPS position of each plot by matching the marked plot on the topographical map.

Table captions Table 1.

- Please provide the captions for “Table 1a” and “Table 1b”, respectively, too.

Answer: Thank you very much for the suggestion. We have separated four Tables (Table S1 to S4).

Table captions Table 2

- All the writing of this caption should be refined and edited by professionals.

Answer: As I mentioned above, all captions were checked by the English proofreading company.

- The word "appearance" may better be replaced with "occurrence."

Answer: In accordance with the reviewer's suggestion, we have changed the word "appearance" to "occurrence" in the manuscript and Tables.

Table 2

- “H. kanda and T. Inoue”; “kanda” should be capitalized as “Kanda”.

Answer: We have deleted above information from the Table and modified.

- As to the GPS positionings, for example, “78.93021°N”, the 5th decimal place (in this case “…1°N”) corresponds to about a 1 m scale, based on a 1° = 111.11… km and a 0.00001° ≈ 111 km/100,000 = 111 m/100 = 1.11 m. I’m not quite sure whether the GPS accuracy in the Polar regions in 1994 was at the level of 1 m or not (probably at a >10-m accuracy). Please clarify this point.

Answer: We agree the reviewer's indication. We have considered the scale of each plot (20- m line transect), and we adopted three places after the decimal point.

To Reviewer #2

The authors carefully revised the manuscript. I have a few additional minor comments that the authors should be clarified. Since the reviewer 1 request us to made a map with sampling plot number, we have added the map as Figure 1.

I really appreciate the reviewer's precise indications. We found mistakes and modified the manuscript as follows,

1. L45. What was your 'plot'? How many 'transects' in each plot? You had 105 (=45+24+29+7) plots but only 98 plots (L50)?

Answer: I appreciate the checking. I have rechecked the plot number and found my mistakes. Correct information is as follows,

ridge (R; 42 plots), slope (S; 20 plots), and wetland (W; 29 plots), and also recorded the gravel/boulder surface texture (GB, 7 plots). (Lines 46-47).

42 + 20 + 29 + 7 = 98

2. L49. Five quadrats at a 5-m interval should give a 20-m transect.

Answer: Yes, we made a mistake. Correct length of the line transects is 20 m. (Line 50).

3rd submission

Editor Start Date: 1/11/2019

Editor Stop Date: 1/17/2019

Reviewer #1 (1/17/2019–1/17/2019)

Editor Comments to the Author:

Reviewer #1 : anonymous

The manuscript has been well revised and is close to be qualified for publication; however, some minor points to be corrected and edited.

Figure 1. The indication of “Ocean” on upper-right of the map should appear as “Kongsfjorden (Kings Bay)".

Table 1. Please replace “appearance” with “occurrence”.

L54-60. The definition of “LO (%)” is based on 0 (absence) or 1 (presence) in a quadrate, and five quadrats were set for an observation plot; the total number of plots was 98. Then, an LO (%) for a plot is calculated as 0/5, 1/5, 2/5, 3/5, 4/5 or 5/5, which corresponds to 0%, 20%, 40%, 60%, 80% or 100%, respectively.

The values shown in Table S3 are such integers (whole numbers) and are NOT averages. If so, L59-60 should be corrected.

L55-56 should be corrected to represent a grammatical sentence.

L63. The “C (%)” should be quantitatively defined before defining “LC (%)”. The C (%) is defiend as the lichen-covered area (cm^2) in a quadrat (900 cm^2) and averaged for a set of five quadrats. If so, please give such a concretely clearer definition.

Authors Response:

To Reviewer #1

Figure 1. The indication of “Ocean” on upper-right of the map should appear as “Kongsfjorden".

Answer: In accordance with the suggestion of the reviewer, we modified from Ocean to Kongsfjorden on Figure 1.

Table 1. Please replace “appearance” with “occurrence”.

Answer: In accordance with the suggestion of the reviewer, we modified from appearance to occurrence

on Table 1.

L54-60. The definition of "LO (%)" is based on 0 (absence) or 1 (presence) in a quadrate, and five quadrats were set for an observation plot; the total number of plots was 98.
Then, an LO (%) for a plot is calculated as 0/5, 1/5, 2/5, 3/5, 4/5 or 5/5, which corresponds to 0%, 20%, 40%, 60%, 80% or 100%, respectively.

The values shown in Table S3 are such integers (whole numbers) and are NOT averages. If so, L59-60 should be corrected.

L55-56 should be corrected to represent a grammatical sentence.

Answer: As suggested by the reviewer, we have inserted actual calculated value of LO(%) in the manuscript (Lines, 59-60). About the Lines 55-56, we have followed English proofreading company's modification.

L63. The "C (%)" should be quantitatively defined before defining "LC (%)". The C (%) is defiend as the lichen-covered area (cm2) in a quadrat (900 cm2) and averaged for a set of five quadrats. If so, please give such a concretely clearer definition.

Answer: As suggested by the reviewer, we have added definition of "*C*(%)" on the manuscript. (Lines, 64-66).

We should like to thank the reviewers for their helpful comments and hope that we have now produced a more balanced and better account of our work (data). We trust that the revised manuscript is acceptable for publication in Polar Data Journal.

Editorial Office's note

Calcurate checksum date: 1/25/2019

Algorithm:SHA256

Hash: 96d241f205476bcb75e25eb7c3c9f5e8266b8df3d2e12af13b745b4ba6

Path:

https://ads.nipr.ac.jp/portal/kiwa/ProductsSelect.action?referer=summary&downloadList=ADS%3AA20180820-001%3A1.80#

Original Data

Inoue, T., Inoue, M., Kaneko, R., Uchida, M., Kudoh, S., Kanda, H. Vegetation data of high Arctic lichens on Austre Broggerbreen glacier foreland, Svalbard archipelago in 1994. 1.80, Arctic Data archive System (ADS), Japan, 2018. https://doi.org/10.17592/001.2018082001.