

DIGITAL SUPPLEMENT TO

SIPMAN, H. J. M.: *Immersaria aegaea*, a puzzling new lichen species from the Mediterranean. – *Acta Botanica Hungarica* 67(1–3), pp. 173–188, 2025
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Alignment of the ITS sequences used for the phylogram of Figure 3

>KJ162267_Porpidia_macrocarpa_UK

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## &gt;OLICH157\_Immersaria\_athrocarpa\_Norway

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## &gt;MZ227392\_Immersaria\_shangrilaensis\_Yunnan

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>MZ227428_Immersaria_aurantia_Qinghai

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 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCTCGGTATTCCGAGGGGCATGCCTGTTGAGCGTCATTAC
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGTTAGTG
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGTCCCCCG
 CTGCGGCCAGCCAGCC~AAC

>MZ227473_Immersaria_aurantia_Tibet

GGGGCT~CCGCGCTCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC
 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCGCGGGGCCG~CCCCGGG
 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAACCAAAA~TCCG~TTTATCTGTGGTCTGTCTG  
 AGAAGAACT~TCAATAACT~AAAACCTTCAACAACGGATCTCTGGTTCTGGCATCGATG  
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCCCTCGGTATTCCGAGGGGCATGCCTGTTTCGAGCGTCATTAC  
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCCC~GGACGTGCCCCGAAAGTTAGTG  
 GCGGTCCGGTTGGGGCTTCGAGCGTAGTAAAT~TTTACCCCGCTTTGTGAAGCCCCCG  
 CTGTGGCCAGCCAGCC~AAC

## &gt;MZ227437\_Immersaria\_spec.\_Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCAGCCCCGACTC~TTCACCCCGTGCGTACCTACC  
 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCGCGGGGCCG~CCCCGGG  
 ~~~CT~CGCGCGCTCCGCCGGAGA~CCAACC~AAACTCCG~TTTATCTGTGATCGTCTG  
 AGAAGAACT~TCAATAACT~AAAACCTTCAACAACGGATCTCTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAAGGGCATGCCTGTTTCGAGCGTCATTAC
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCCC~GGACGTGCCCCGAAAGTTAGTG
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTACCCCGCTTTGTGAAGCCCCCG
 CTGCGGCCAGCCAGCC~AAC

>MZ227430_Immersaria_spec._Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCAGCCCCGACTC~TTCACCCCGTGCGTACCTACC
 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCGCGGGGCCG~CCCCGGG
 ~~~CT~CGCGCGCTCCGCCGGAGA~CCAACC~AAACTCCG~TTTATCTGTGATCGTCTG  
 AGAAGAACT~TCAATAACT~AAAACCTTCAACAACGGATCTCTGGTTCTGGCATCGATG  
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAAGGGCATGCCTGTTTCGAGCGTCATTAC  
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCCC~GGACGTGCCCCGAAAGTTAGTG  
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTACCCCGCTTTGTGAAGCCCCCG  
 CTGCGGCCAGCCAGCC~AAC

## &gt;MZ227446\_Immersaria\_spec.\_Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCAGCCCCGACTC~TTCACCCCGTGCGTACCTACC  
 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCGCGGGGCCG~CCCCGGG  
 ~~~CT~CGCGCGCTCCGCCGGAGA~CCAACC~AAACTCCG~TTTATCTGTGATCGTCTG  
 AGAAGAACT~TCAATAACT~AAAACCTTCAACAACGGATCTCTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAAGGGCATGCCTGTTTCGAGCGTCATTAC
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCCC~GGACGTGCCCCGAAAGTTAGTG
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTACCCCGCTTTGTGAAGCCCCCG
 CTGCGGCCAGCCAGCC~AAC

>MZ227467_Immersaria_ferruginea_Tibet

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC
 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCGCGGGGCCG~CCCCGGG
 ~~~CT~CGCGCGCTCCGCCGGAGA~CCAACC~AAACTCCG~TTTATCTGTGATCGTCTG  
 AGAAGAACT~TCAATAACT~AAAACCTTCAACAACGGATCTCTGGTTCTGGCATCGATG  
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAGGGGCATGCCTGTTTCGAGCGTCATTAC  
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCCC~GGACGTGCCCCGAAAGTTAGTG  
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTACCCCGCTTTGTGAAGCCCCCG  
 CTGCGGCCAGCCAGCC~AAC

## &gt;MZ227399\_Immersaria\_ferruginea\_Sichuan

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC  
 ~TTTGTTGCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~CCCCGGG  
 ~~~CT~CGCGCGCTCCGCCGAGA~CCAACC~AAATTCCG~TTTATCTGTGATCGTCTG  
 AGAAGAACT~TCAATAACT~AAAACTTTCAACAACGGATCTCTTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCTTGGTATTCGAGGGGCATGCCTGTTGAGCGTCATTAC
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGTTAGTG
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGCCCCCG
 CTGCGGCCAGCCAGCC~AAC

>MZ227466_Immersaria_ferruginea_Tibet

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC
 ~TTTGTTGCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~CCCCGGG
 ~~~CT~CGCGCGCTCCGCCGAGA~CCAACC~AAATTCCG~TTTATCTGTGATCGTCTG  
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 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCTTGGTATTCGAGGGGCATGCCTGTTGAGCGTCATTAC  
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGTTAGTG  
 GCGGTCCGGTTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGCCCCCG  
 CTGCGGCCAGCCAGCC~AAC

## &gt;MZ227481\_Immersaria\_venusta\_Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCTGTGCGTACCTACC  
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 ~~~CT~CGCGCGTGTCCGCCGAGA~CCAACC~AAACTCCG~TTTATCTGTGGTCTGCTG  
 AGAAGCACT~TCAATAACT~AAAACTTTCAACAACGGATCTCTTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCTTGGTATTCGAGGGGCATGCCTGTTGAGCGTCATTAC
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGGTAGTG
 GCGGTCCGGTGGGACTTCGAGCGTAGTAAAA~TTTCACCCCGCTTTGTGAAGCCCCCG
 TCGCGGCCAGCCAGCC~AAC

>MZ227480_Immersaria_venusta_Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCTGTGCGTACCTACC
 ~TTTGTTGCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~CCCCGGG
 ~~~CT~CGCGCGTGTCCGCCGAGA~CCAACC~AAACTCCG~TTTATCTGTGCTCGTCTG  
 AGAAGCACT~TCAATAACT~AAAACTTTCAACAACGGATCTCTTGGTTCTGGCATCGATG  
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCTTGGTATTCGAGGGGCATGCCTGTTGAGCGTCATTAC  
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGGTAGTG  
 GCGGTCCGGCTGGGACTTCGAGCGTAGTAAAA~TTTCACCCCGCTTTGTGAAGCCCCCG  
 TCGCGGCCAGCCAGCC~AAC

## &gt;MZ227439\_Immersaria\_venusta\_Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC  
 ~TTTGTTGCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~CCCCGGG  
 ~~~CT~CGCGCGTGTCCGCCGAGA~CCAACC~AAACTTCG~TTTATCTGTGGTCTGCTG  
 AGAAGCACT~TCAATAACT~AAAACTTTCAACAACGGATCTCTTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCTTGGTATTCGAGGGGCATGCCTGTTGAGCGTCATTAC
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGGTAGTG
 GCGGTCCGGTGGGACTTCGAGCGTAGTAAAA~TTTCACCCCGCTTTGTGAAGCCCCCG
 TCGGACCAGCCAGCC~AAC

>MZ227421 *Immersaria venusta* Qinghai

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC
 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~CCCCGGG
 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAAC~AAACTCCG~TTTATCTGTGGTCTGCTG  
 AGAAGCACT~TCAATAACT~AAAAC~TTCAACAACGGATCTCTTGGTTCTGGCATCGATG  
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAGGGGCATGCCTGTTTCGAGCGTCATTAC  
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCGAAAGGTAGTG  
 GCGGTCCGGCTGGGACTTCGAGCGTAGTAAAA~TTTCACCCCGCTTTGTGAAGCCCCCG  
 TCGCGGCCAGCCAGCC~AAC

>MZ227452 *Immersaria venusta* Qinghai

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 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAAC~AAACTCCG~TTTATCTGTGATCGTCTG  
 AGAAGCACT~TCAATAACT~AAAAC~TTCAACAACGGATCTCTTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAGGGGCATGCCTGTTTCGAGCGTCATTAC
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCGAAAGGTAGTG
 GCGGTCCGGCTGGGACTTCGAGCGTAGTAAAA~TTTCACCCCGCTTTGTGAAGCCCCCG
 TCGCGGCCAGCCAGCC~AAC

>MZ227395 *Immersaria athroocarpa* Inner Mongolia

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 ~TTTGTGTCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~TCCCGGG
 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAAC~AAACTCCG~TTTATCTGTGGTCTGCTG  
 AGAAGAACT~TCAATAACT~AAAAC~TTCAACAACGGATCTCTTGGTTCTGGCATCGATG  
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAGGGGCATGCCTGTTTCGAGCGTCATTAC  
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCGAAAGGTAGTG  
 GCGGTCCGATTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGCTTCCCG  
 TCGCGGCCAGCCAGCC~AAC

>MZ227394 *Immersaria athroocarpa* Inner Mongolia

GGGGCC~CCGCGCCCC~GGGGGTTCGGGCCCCGACTC~TTCACCCCGTGCGTACCTACC  
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 AGAAGAACT~TCAATAACT~AAAAC~TTCAACAACGGATCTCTTGGTTCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
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 AACCTCAAGCTTCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCGAAAGGTAGTG
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>MZ227391 *Immersaria athroocarpa* Inner Mongolia

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 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAAC~AAACTCCG~TTTATCTGTGGTCTGCTG  
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 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC  
 TTTGAACGCACATTGCGCCCCCTTGGTATTCCGAGGGGCATGCCTGTTTCGAGCGTCATTAC  
 AACCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCGAAAGGTAGTG  
 GCGGTCCGATTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGCCCCCG  
 TCGCGGCCAGCCAGCC~AAC

## &gt;MZ227393\_Immersaria\_athroocarpa\_Inner\_Mongolei

GGGGCC~CCGCGCCCC~~GAGGGCTCCGGCCCCGACTC~TTCACCCCGTGCGTACCTACC  
 ~TCTGTTGCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~~CCCCGGG  
 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAACC~AAACTCCG~TTTATCTGTGGTCGTCTG  
 AGAAGAACT~TCAATAACT~AAAACTTTCAACAACGGATCTCTTGGTTCCTGGCATCGATG
 AAGAACGCAGCGAAATGCGATAAGTAATGTGAATTGCAGAATTTAGTGAATCATCGAATC
 TTTGAACGCACATTGCGCCCCTCGGTATTCCGAGGGGCATGCCTGTTGAGCGTCATTAC
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGGTAGTG
 GCGGTCCGATTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGCCCCCCG
 TCGCGGCCAGCCAGCC~AAC

>MZ227390_Immersaria_athroocarpa_Inner_Mongolei

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 ~TCTGTTGCTTCGGCGGGCCTCGGGTGACCCCGACGCCGGCCCGGGGGCCG~~CCCCGGG
 ~~~CT~CGCGCGTGTCCGCCGGAGA~CCAACC~AAACTCCG~TTTATCTGTGGTCGTCTG  
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 TTTGAACGCACATTGCGCCCCTCGGTATTCCGAGGGGCATGCCTGTTGAGCGTCATTAC  
 AACCCTCAAGCTCCGCTTGGTATTGGGTCTCGTCCCC~GGACGTGCCCCGAAAGGTAGTG  
 GCGGTCCGATTGGGACTTCGAGCGTAGTAAAT~TTTCACCCCGCTTTGTGAAGCCCCCCG  
 TCGCGGCCAGCCAGCC~AAC