**Supplementary Table 4.** Morphological characters and character states of the *Lophodermella* and non-*Lophodermella* species

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** |
|  | **Ascocarps** | **Ascocarps** | **Asci shape** | **Ascospores** | **Host** |
|  | 0 non-linear or -elliptical, 1 mostly linear, nervisequious, dark brown to black, 2 mostly elliptical, concolorous to black | external/superficial 0,subcuticular 1,intraepidermal 2,supepidermal 3, subhypodermal 4 | 0 more or less broadly saccate to clavate, 1 narrowly clavate or cylindrical | Acicular 0,Filiform 1,Clavate 2,Cylindrical 3, fusiform to oval 4, rod-shaped 5, doube-spindle shaped 6, ellipsoid to fusiod 7 | Non-pine 0, Pine 1 |
| *Lophodermella montivaga* | 2 | 4 | 0 | 2 | 1 |
| *Lophophacidium dooksii* | 1 | 4 | 0 | 4 | 1 |
| *Lophodermella arcuata* | 2 | 4 | 0 | 2 | 1 |
| *Lophodermella sp.* | 2 | 4 | 0 | 2 | 1 |
| *Lophodermella concolor* | 2 | 4 | 1 | 2 | 1 |
| *Lophodermium pinastri* | 2 | 3 | 0 | 1 | 1 |
| *Lophodermium australe* | 1 | 3 | 1 | 1 | 1 |
| *Lophodermium conigenum* | 2 | 3 | 1 | 1 | 1 |
| *Elytroderma deformans* | 2 | 3 | 0 | 3 | 1 |
| *Meloderma desmazieresii* | 2 | ? | 1 | 5 | 1 |
| *Bifusella linearis* | 2 | 1 | 0 | 6 | 1 |
| *Lophodermium resinosum* | 2 | 3 | 1 | 1 | 1 |
| *Lophodermium molitoris* | ? | ? | ? | ? | ? |
| *Therrya pini* | 0 | 3 | 0 | 1 | 1 |
| *Therrya fuckelii* | 0 | 3 | 0 | 3 | 1 |
| *Coccomyces mucronatus* | 0 | 2,3 | 1 | 1 | 0 |
| *Cudonia sichuanensis* | 0 | 0 | 0 | 0 | 0 |
| *Spathularia flavida* | 0 | 0 | 1 | ? | ? |
| *Colpoma quercinum* | 2 | ? | 1 | 1 | 0 |
| *Rhytisma acerinum* | 2 | 1 | 1 | 3 | 0 |
| *Rhytisma punctatum* | ? | ? | ? | ? | ? |
| *Hypoderma rubi* | 2 | 1 | 1 | 2,3 | 0 |
| *Hypoderma minterii* | ? | ? | ? | ? | ? |
| *Rhytisma salicinum* | ? | ? | ? | ? | ? |
| *Lirula macrospora* | 2 | 2 | 1 | 1,3 | 1 |
| *Lophodermium piceae* | 2 | 2 | 1 | 1 | 0 |
| *Tryblidiopsis pinastri* | 0 | ? | 1 | 2 | 0,1 |
| *Chalara sp.* | 0 | 1 | 1 | 7 | ? |
| *Lophodermella sulcigena* | 2 | 4 | 0 | 2 | 1 |
| *Lophodermella conjuncta* | 2 | 4 | 1 | 2 | 1 |
| *Fungal endophyte 3277* | ? | ? | ? | ? | ? |
| *Fungal endophyte 5744* | ? | ? | ? | ? | ? |