

Curatorial Procedures of the University of Alberta Microfungus Collection and Herbarium (UAMH)

UAMH ACCESSION PROCEDURES (Fig. 1)

Fungi are received for deposit or for identification. On arrival, isolates are grown on various types of media and under different growing conditions. The identification is verified or determined by morphological comparison with similar accessions or descriptions in the literature and/or by DNA sequence comparison. When a name is found, the sender is notified and the isolate may be selected for deposit into the permanent collection. Isolates that are unique, from unusual habitats, or are members of a species not already well represented in the collection are accessioned as follows:

- 1) A UAMH accession number is assigned.
- 2) The fungus is grown on a cellophane membrane layered on agar media for preparation of dried colonies.
- 3) Permanent microscopic slides, photographs and line drawings are prepared.
- 4) Data on provenance and known properties are entered into the database.
- 5) The fungus is preserved by two or more methods.

HERBARIUM PROCEDURES

- Most fungal herbaria follow methods similar to those traditionally used for green plants: specimens usually consisting of a portion of the fungus growing on the host, are stored in paper envelopes affixed to large cardboard sheets which are then stacked horizontally in herbarium cabinets.
- This technique works well for macrofungi, but is less useful for delicate microfungi.
- At UAMH, herbarium specimens consist of dried colonies on cellophane membranes (Fig. 2a).
- These dried colonies provide a durable record of the fungus growing in vitro, demonstrating various features of the colonial morphologies including growth rates, color, texture, reverse pigmentation.
- Images and camera lucida drawings of the microscopic morphology are obtained for the majority of isolates, and these provide a multidimensional characterization for each strain.
- All materials are stored in folders labelled with strain data (Fig. 2a).
- Small colored tags affixed to strain folders denote information stored for a strain, i.e. green tags indicate images, yellow tags indicate drawings, red tags indicate strain derived from type.
- The folders are filed vertically in conveniently accessible file drawers (Fig. 2 b, c).
- Genera and species, distinguished by colored labelled cards, are filed alphabetically, followed by strain folders in ascending numerical order.



Fig. 2. UAMH filing system: a. dried colonies on cellophane membrane stored in folders labeled with strain data b-c. folders stored vertically in file drawers.

PREPARING DRIED COLONIES

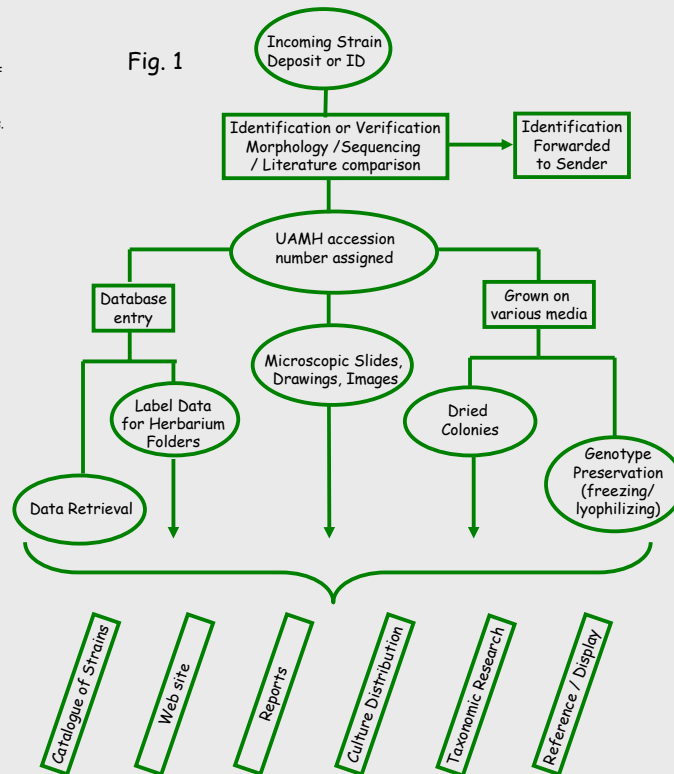
Colonies are grown on media overlaid with a sterilized cellophane membrane and dried in specially designed lucite plastic drying presses.

- The procedure is as follows:
- 1) A cellophane membrane, 6.5 cm square, is laid on the surface of an agar plate (Fig. 3)
 - 2) The fungus is inoculated on the centre of the membrane.
 - 3) Fungi absorb nutrients through the membrane.
 - 4) When a colony is fully developed (2 to 5 weeks) (Fig. 3), it is lifted from the agar and transferred to the press (Fig. 4).
 - 5) A cardboard frame measuring 9.5 x 7.5 x 0.2 cm thick is labeled with the fungus name and growth conditions.
 - 6) The frame is prepared by adding a thin bead of glue around the underside of the opening, and then placed over the cellophane colony and clamped in place.
 - 7) The colonies are air-dried several days in a biological safety cabinet under a U.V. germicidal lamp.
 - 8) The dried colonies are placed in polyethylene sleeves and placed into the herbarium folder (Fig. 2b).



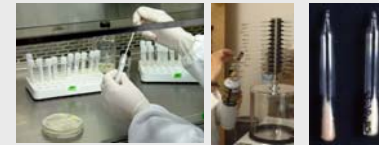
UAMH ACCESSION PROCEDURES

Fig. 1



STRAIN PRESERVATION

Many microfungi sporulate well in culture. Sporulating isolates are preserved by freeze drying (Fig. 6a) and by freezing in vapor phase of liquid nitrogen (approx. -135°C) (Fig. 6b). Non-sporulating fungi that cannot be lyophilized are stored frozen, under oil and in water at 4°C. Inventory information on the procedures used to preserve a particular strain is maintained in the data base (Fig. 6c).



6a. Freeze drying.



6b. Preparing straws for freezing in liquid nitrogen.

UAMH Preservation Available

May 23, 2006

Accession #	Species	Accession #	Species	Accession #	Species
1000	Aspergillus	1001	Aspergillus	1002	Aspergillus
1003	Aspergillus	1004	Aspergillus	1005	Aspergillus
1006	Aspergillus	1007	Aspergillus	1008	Aspergillus
1009	Aspergillus	1010	Aspergillus	1011	Aspergillus
1012	Aspergillus	1013	Aspergillus	1014	Aspergillus
1015	Aspergillus	1016	Aspergillus	1017	Aspergillus
1018	Aspergillus	1019	Aspergillus	1020	Aspergillus
1021	Aspergillus	1022	Aspergillus	1023	Aspergillus
1024	Aspergillus	1025	Aspergillus	1026	Aspergillus
1027	Aspergillus	1028	Aspergillus	1029	Aspergillus
1030	Aspergillus	1031	Aspergillus	1032	Aspergillus
1033	Aspergillus	1034	Aspergillus	1035	Aspergillus
1036	Aspergillus	1037	Aspergillus	1038	Aspergillus
1039	Aspergillus	1040	Aspergillus	1041	Aspergillus
1042	Aspergillus	1043	Aspergillus	1044	Aspergillus
1045	Aspergillus	1046	Aspergillus	1047	Aspergillus
1048	Aspergillus	1049	Aspergillus	1050	Aspergillus
1051	Aspergillus	1052	Aspergillus	1053	Aspergillus
1054	Aspergillus	1055	Aspergillus	1056	Aspergillus
1057	Aspergillus	1058	Aspergillus	1059	Aspergillus
1060	Aspergillus	1061	Aspergillus	1062	Aspergillus
1063	Aspergillus	1064	Aspergillus	1065	Aspergillus
1066	Aspergillus	1067	Aspergillus	1068	Aspergillus
1069	Aspergillus	1070	Aspergillus	1071	Aspergillus
1072	Aspergillus	1073	Aspergillus	1074	Aspergillus
1075	Aspergillus	1076	Aspergillus	1077	Aspergillus
1078	Aspergillus	1079	Aspergillus	1080	Aspergillus
1081	Aspergillus	1082	Aspergillus	1083	Aspergillus
1084	Aspergillus	1085	Aspergillus	1086	Aspergillus
1087	Aspergillus	1088	Aspergillus	1089	Aspergillus
1090	Aspergillus	1091	Aspergillus	1092	Aspergillus
1093	Aspergillus	1094	Aspergillus	1095	Aspergillus
1096	Aspergillus	1097	Aspergillus	1098	Aspergillus
1099	Aspergillus	1100	Aspergillus	1101	Aspergillus
1102	Aspergillus	1103	Aspergillus	1104	Aspergillus
1105	Aspergillus	1106	Aspergillus	1107	Aspergillus
1108	Aspergillus	1109	Aspergillus	1110	Aspergillus
1111	Aspergillus	1112	Aspergillus	1113	Aspergillus
1114	Aspergillus	1115	Aspergillus	1116	Aspergillus
1117	Aspergillus	1118	Aspergillus	1119	Aspergillus
1120	Aspergillus	1121	Aspergillus	1122	Aspergillus
1123	Aspergillus	1124	Aspergillus	1125	Aspergillus
1126	Aspergillus	1127	Aspergillus	1128	Aspergillus
1129	Aspergillus	1130	Aspergillus	1131	Aspergillus
1132	Aspergillus	1133	Aspergillus	1134	Aspergillus
1135	Aspergillus	1136	Aspergillus	1137	Aspergillus
1138	Aspergillus	1139	Aspergillus	1140	Aspergillus
1141	Aspergillus	1142	Aspergillus	1143	Aspergillus
1144	Aspergillus	1145	Aspergillus	1146	Aspergillus
1147	Aspergillus	1148	Aspergillus	1149	Aspergillus
1150	Aspergillus	1151	Aspergillus	1152	Aspergillus
1153	Aspergillus	1154	Aspergillus	1155	Aspergillus
1156	Aspergillus	1157	Aspergillus	1158	Aspergillus
1159	Aspergillus	1160	Aspergillus	1161	Aspergillus
1162	Aspergillus	1163	Aspergillus	1164	Aspergillus
1165	Aspergillus	1166	Aspergillus	1167	Aspergillus
1168	Aspergillus	1169	Aspergillus	1170	Aspergillus
1171	Aspergillus	1172	Aspergillus	1173	Aspergillus
1174	Aspergillus	1175	Aspergillus	1176	Aspergillus
1177	Aspergillus	1178	Aspergillus	1179	Aspergillus
1180	Aspergillus	1181	Aspergillus	1182	Aspergillus
1183	Aspergillus	1184	Aspergillus	1185	Aspergillus
1186	Aspergillus	1187	Aspergillus	1188	Aspergillus
1189	Aspergillus	1190	Aspergillus	1191	Aspergillus
1192	Aspergillus	1193	Aspergillus	1194	Aspergillus
1195	Aspergillus	1196	Aspergillus	1197	Aspergillus
1198	Aspergillus	1199	Aspergillus	1200	Aspergillus

Fig. 6c. Information retrieved from the database on preservation inventory.

DATA STORAGE AND RETRIEVAL - DATABASE APPLICATION

The UAMH database stores a vast and continuously expanding library of information on strain history and properties and provides an efficient means of entering, analyzing and retrieving these data. The application is currently developed in Microsoft SQL server and Visual Basic.

Data are organized into related tables linked by SPECIES name and STRAINID, i.e. UAMH accession number. Fig. 7 shows an overview of the database design showing organization of data into related tables.

Customized screens developed in Visual Basic allow for searching, reviewing and reporting of data from several related tables (Fig. 8). The database allows for searches by species name, accession number, sender's name and number, incoming name, cross-reference numbers, metabolites produced, strain properties (thermophilic, thermotolerant, etc.) or other types of data.

The database is used to generate a catalogue of living strains (Fig. 5a) and other types of reports. Exported files are used as the data source for Word mail merge functions. Output protocols produce labels for herbarium strain folders (Fig. 2a) or species cards, information on cultures distributed (Fig. 5b), preservation inventories (Fig. 6b), or other documents.

Researchers worldwide access information through the website at www.devonian.ualberta.ca/uamh.

CULTURE DISTRIBUTION

Cultures are distributed worldwide to scientists in different disciplines. Scientists select isolates by means of the web-based or print *Catalogues* (Fig. 5a.) They can select strains appropriate for particular applications by searching the database for strains producing metabolites or having particular properties. Cultures distributed are accompanied by information generated by the database (Fig. 5b).

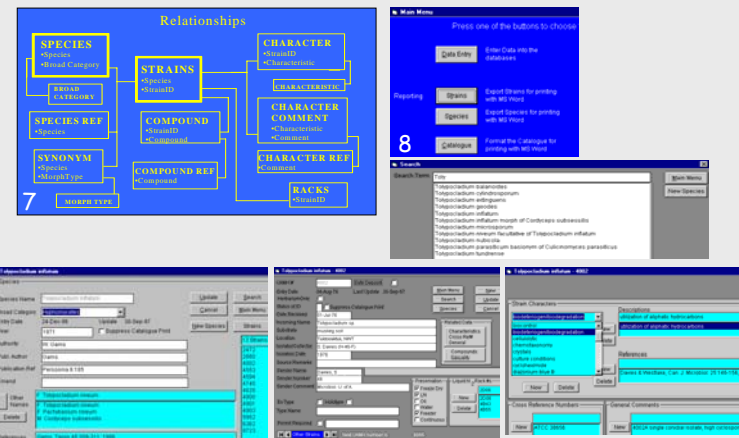
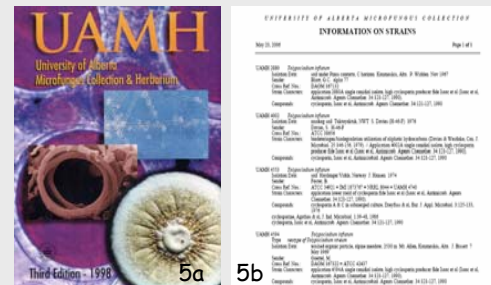


Figure 8. Customized screens for searching, entering, reviewing and reporting data from related tables.