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We have suggested that lines from the eye to the mouth or beak aid small vertebrates in aiming on prey. Support for this hypothesis is based on the position of the lines and on ecological evidence; for example, eye lines are more often present in predaceous species than in nonpredaceous species. Charman contends that it is unlikely that eye lines function in aiming because binocularity in certain predaceous species using temporal foveae would make it difficult to sight along the line and eye lines would be blurred due to limited depth-of-focus.

Most small vertebrates with eye lines feed with a quick stereotyped strike over a short distance with little or no correction once the strike has begun. The prey, although capable of swift movement is often stationary during the strike. The birds which Charman indicates as feeding on the wing are not feeding in the way which we indicate is usual for species with eye lines.

As Charman points out, predators which feed on the wing have a tendency for enhanced binocularity. However, in other avian species more monocularity is characteristic (*1*). Lizards, some species of which have eye lines, typically have binocular fields of only 10 to 20 degrees. Such species are attacked by larger predators, which may have been one of the selection pressures for laterality of the eyes and consequent monocularity (*2*).

In contrast to Charman's statement on limited depth-of-focus in birds, Pumphrey (*3*) states that the shortening of focus in small birds is "rapid and ample" and that the act of accommodation is accompanied by pupillary action which increases depth-of-focus. Birds can probably see the eye lines since they typically have two to five times the accommodation abilities of man (*4*). Small species have some advantages in vision as compared to larger species; they have a closer commencement point, not needing accommodation unless the object is very close, and the small eye has a much greater depth-of-focus than the larger eye (*2*). In addition, the properties of the eye line may enhance vision. The frequent setting of the dark stripe on a light background or overset by a light line introduces the phenomenon of simultaneous contrast (*5*). Often the eye line is wide at the eye and narrows at the beak or snout, which along with the increasing distance from the eye, would emphasize the tip of the line.

Charman suggests that the main functions of such lines are in species or sexual recognition or in disruptive camouflage. In wood warblers, for example, if the eye lines are used as species or sexual recognition marks, the following must be taken into account: (i) Why do closely related sympatric species have rather similar eye lines (although the rest of their facial patterns is usually very dissimilar)? (ii) Why are eye lines present in immature, female, and nonbreeding plumages as well as male plumages in many species? Although overall facial patterns probably do function in recognition, it seems doubtful that the relatively inconspicuous eye lines would have primarily this function. To be disruptive the lines would have to nearly cover the eye, which is usually not the case.

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Emmonsiella capsulata: Perfect State of Histoplasma capsulatum

Kwon-Chung (*1*) has reported the observation of sexual reproduction in *Histoplasma capsulatum.* Extensive studies of the ascocarp revealed that the perfect state of *H. capsulatum,* though resembling *Ajellomyces dermatitidis* (*2*) differs sufficiently from all previously known genera to warrant its description as a new genus in Gymnoascaceae. The detailed description of the development of the ascocarp, proof of heterothallism and the results of pairing between soil and human isolates of different geographic origins are in preparation. The purpose of this note is to provide the Latin diagnosis of *Emmonsiella capsulata*, the perfect state of *Histoplasma capsulatum.*

Description

Emmonsiella Kwon-Chung, gen. nov.

Cleistothecia e globosa subglobosa vel irregulariter stellata; peridium spiris radiantibus ex origine ascogoniali constitutum: hyphae sinuatae reticulatae e spiris enatae; asci piriformes usque ad clavati, ascosporas octo globosas continentes.

Cleistothecia globose to subglobose or irregularly stellate, buffy at maturity. Peridium composed of septate, tight coils radially arising from ascogonia and sinuate, septate hyphae which form a reitculum and originate from the coils. Asci pear- to club-shaped with eight globose ascospores.

Emmonsiella capsulata Kwon-Chung, sp. nov.

Fungus heterothallicus; cleistothecia e globosa subglobosa vel irregulariter stellata lutea 80 ad 250 μm diametrum; peridium spiris radiantibus exorigine ascogoniali 1.7 ad 3 μm diametrum, 30 ad 100 μm longis constitutum; hyphae sinuatae reticulatae 1.4 ad 2 μm diametrum e spiris enatae; asci piriformes vel clavati 3 ad 5 × 10 ad 16 μm, octospori; ascosporae hyalinae glabrae globosae 1.5 ad 2 μm dimetrum.

Status conidicus: *Histoplasma capsulatum* Darling, 1906.

Heterothallic fungus—Cleistothecia white, globose at first becoming buffy, subglobose to irregularly stellate, 80 to 250 μm in diameter. Peridium composed of two distinct structures: tightly coiled septate hyphae ranging from two to ten, usually three to five, arising radially from the ascogonium; sinuate septate, anastomosing hyphae, branching from the coils. The coils, 1.7 to 3 μm in diameter, 30 to 100 μm long, buffy with 0.8- to 1-μm thick inner wall and 0.3- to 0.5-μm thick outer wall, frequently grow beyond the margin of the sinuate peridial hyphal net, forming the arms in stellate ascocarps. The sinuate hyphae arise from the outer wall of the coils and tend to branch dichotomously and anastomose to form a netlike mesh of myecelium covering the ascogenous hyphae and the most part of the coils. Asci eight-spored, club- to pear-shaped, 3 to 5 by 10 to 16 μm with straight or curved base. Ascospores hyaline, globose, smooth, 1.5 to 2 μm in diameter.

Asexual state: *Histoplasma capsulatum* Darling, 1906.

Habitat: Soil.

Holotype: Formalin treated and dried agar cultures of BPI 71811 (my designation of T-3-1 × T-4-2); paratypes: BPI 71812 (T-3-1) and BPI 71813 (T-4-2) have been deposited in the Herbarium, National Fungus Collection, U.S. Department of Agriculture, Beltsville, Maryland.

Living cultures of T-3-1 (ATCC 22635) and T-4-2 (ATCC 22636) have been deposited in the American Type Culture Collection, Rockville, Maryland, and with the Centraalbureau voor Schimmelcultures, Baarn, The Netherlands: CBS 136.72 (T-3-1), DBS 137.72 (T-4-2).

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Limitations of the Hildebrand-Batschinski Shear Viscosity Equation

Hildebrand (*1*) recently reviewed and extolled the merits of an empirical viscosity equation originally proposed by Batschinski (*2*) for simple liquids. The equation is of the form

$$\phi \equiv \frac{1}{\eta} = a_1V + a_2 \qquad (1)$$

where a_1 and a_2 are empirical constants and V is the molar volume of the liquid with shear viscosity η or fluidity ϕ.

The apparent simplicity of a volume dependence for fluidity is most appealing in practice, particularly for correlations of molecular structure with fluidity.

In our analysis of the validity of the Batschinski equation we were interested primarily in its usefulness in fitting and smoothing empirical data and less in its theoretical implications and foundations. In selecting relevant viscosity data for liquids from the open literature we adopted the following criteria: (i) Selected data were of the highest precision and accuracy consistent with relatively wide pressure and temperature ranges. (ii) We examined data for key liquids representative of types of substances that cover a wide range of intermolecular forces, namely, simple van der Waals fluids, such as the normal alkanes; and at the other extreme, for substances with specific interactions, such as the hydrogen-bonded liquid, normal pentanol.

Ordinarily, high-precision viscosity measurements at ambient pressure are made with capillary viscometers for which the measured variables are temperature and kinematic viscosity, $\nu = \eta/\rho$, the ratio of the shear viscosity and density. For this reason, Eq. 2 was used for the analysis:

$$\nu^{-1} = a_3\rho + a_4 \qquad (2)$$

Equation 2 is equivalent to Eq. 1 with $a_4 = Ma_1$ and $a_3 = a_2$, where M is the molecular weight.

Table 1 is a comparison of the deviations (d) for values of ν^{-1} calculated from Eq. 2 (by using values of a_3 and a_4 determined by the method of least squares) with the estimated experimental uncertainties for the selected kinematic viscosity data.

Table 1. Comparison of the estimated experimental uncertainties (U) with the deviations (d) for values of ν^{-1} calculated from Eq. 2 with a_3 and a_4 determined by the method of least squares.

U (%)	d (%)	t (°C)	P (atm)	Ref.
		n-*Hexane*		
0.4	4.26	45.23	1	(*3*)
0.3	3.63	36.86	1	(*3*)
0.2	2.31	23.11	1	(*3*)
0.2	2.19	20.91	1	(*3*)
1.0	2.87	20.0	1	(*4*)
0.2	0.09	4.24	1	(*3*)
0.2	−0.71	−2.37	1	(*3*)
0.2	−1.44	−6.45	1	(*3*)
1.0	−0.80	−20.0	1	(*4*)
1.0	−2.77	−40.1	1	(*4*)
1.0	−5.47	−60.1	1	(*4*)
1.0	−6.32	−80.2	1	(*4*)
1.0	−2.41	−90.3	1	(*4*)
1.0	−0.66	−92.3	1	(*4*)
1.0	0.11	−94.3	1	(*4*)
1.0	1.31	−95.7	1	(*4*)
1.0	1.32	−96.3	1	(*4*)
1.0	3.11	−96.8	1	(*4*)
1.0	4.35	−97.5	1	(*4*)
1.0	5.61	−98.5	1	(*4*)
		n-*Heptadecane*		
0.2	4.07	22.00	1	(*5*)
0.2	−7.98	50.00	1	(*5*)
0.2	−2.17	99.71	1	(*5*)
0.3	6.28	149.97	1	(*5*)
0.5	13.01	201.26	1	(*5*)
0.6	16.52	248.46	1	(*5*)
0.8	19.20	300.6	1	(*5*)
		n-*Decane*		
1.5	−6.5	37.8	13.6	(*6*)
1.5	−7.4	37.8	68.0	(*6*)
1.5	1.1	37.8	272	(*6*)
1.5	6.4	37.8	544	(*6*)
1.5	−6.1	71.1	13.6	(*6*)
1.5	−3.8	71.1	54.4	(*6*)
1.5	−2.1	71.1	136	(*6*)
1.5	1.5	71.1	476	(*6*)
1.5	−2.3	104	13.6	(*6*)
1.5	0.5	104	54.4	(*6*)
1.5	1.7	104	204	(*6*)
1.5	1.4	104	408	(*6*)
1.5	2.2	137	13.6	(*6*)
1.5	0.6	137	136	(*6*)
1.5	0.6	137	408	(*6*)
1.5	5.8	171	13.6	(*6*)
1.5	7.4	171	54.4	(*6*)
1.5	4.4	171	68.0	(*6*)
1.5	1.0	171	340	(*6*)
		1-Pentanol		
0.1	15.8	−18.27	1	(*3*)
0.1	−6.05	−10.25	1	(*3*)
0.1	−14.2	−0.90	1	(*3*)
0.1	−12.1	9.963	1	(*3*)
0.05	−1.00	25.000	1	(*3*)
0.05	2.70	29.575	1	(*3*)
0.1	11.8	40.000	1	(*3*)
0.4	27.1	60.000	1	(*3*)
1.2	38.5	79.147	1	(*3*)

It can be seen that the simple form of Eq. 1 or Eq. 2 will not satisfactorily represent the experimental data for the four substances, *n*-hexane, *n*-decane, *n*-heptadecane, or 1-pentanol over reasonable temperature ranges, within experimental uncertainties. In each case the deviations of the calculated reciprocal viscosities are both systematic and in excess of experimental uncertainty.

The Newtonian shear viscosity at zero shear rate may reasonably be regarded as an intensive thermodynamic variable of state. From this point of view it is not at all surprising that the viscosity or fluidity is not a function of a single thermodynamic variable, such as the volume.

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