

A. Feinstein
Observatorio Astronómico
Universidad Nacional de la Plata, Argentina

UBV observations of stars in the small and compact cluster Tr 15 located 20 arcmin north of Eta Carinae confirms its physical connection to the OB aggregate comprising TR 14, Tr 16 and Cr 228. Its corrected distance modulus is $V_0 - M_V = 12.1$, with a mean interstellar absorption of $A_V = 1.4 \pm 0.2$ mag. Two very red variable stars, RT Car, close to the cluster (2 arcmin), and BO Car, about 8 arcmin southeast, appear to be related to the cluster itself. These two are the only bright red supergiants in the whole region, and from the RI_{CK} measures the probable membership of both is verified. The extinction law from the $B-V$, $V-I$ diagram indicates a higher value of R in comparison with the normal one, but lower than the amount derived earlier for the Tr 14/16 (Feinstein, Marraco, and Muzzio 1973), and which is also confirmed with new measures in this photometric system. The extinction law for the young cluster NGC 6611 (Feinstein, in preparation) appears to be the same, in spite of being probably younger.

Two or three early type stars in Tr 15 are in the evolutionary sequence. The earlier one was classified as O9 III by Walborn (1973). The brighter star on the main sequence has $M_V = -3.5$ mag, resulting in an age of $\approx 6 \times 10^6$ years, in very good agreement with Harris's (1976) classification of clusters with M supergiants. Therefore, Tr 15 is older than Tr 14/16, which was already noted by Walborn (1973).

The interstellar absorption for RT Car, $A_V = 2.8$ mag, derived by Humphreys, Stecker, and Ney (1972) puts this star much farther than the cluster itself. But this result may be due to a small nebular which surrounds it, and which is very noticeable in the infrared band. It presents an elongated brightness distribution in the north-south direction in respect to the variable.

To check the relation of the ZAMS with all this group, the open cluster NGC 6611 was observed; it was employed by A. Blaauw (1963) in the derivation of the ZAMS for early type stars. Our data

confirm his conclusions and therefore it becomes clear that Tr 14/16 is older than NGC 6611, in which contracting stars at about $M_V = -3$ mag are also present. This is not the case for the stars in Tr 14/16.

Finally, it is interesting to compare the brightest stars of Tr 15 with some stars of neighbouring clusters, that is Tr 14/16, 20 arcmin south; Cr 228, 30 arcmin south; and NGC 3293 about 2° northwest. In the following table are given some relevant information of the brightest stars in the main sequence, and the mean color excess and distance modulus of each cluster:

	Sp. Type	M_V	$\langle E_{B-V} \rangle$	$V_0 - M_V$
Tr 15	09	-3.5 mag	0.46 mag	12.1 mag
Tr 14/16	03	-6	0.40 - 0.50	12.1 (R=4)
Cr 228	09	-4.5	0.30 - 0.45	12.0
NGC 3293	B0	-3.5	0.31	12.1

It becomes clear that the youngest star cluster is in the center position with respect to the older clusters.

REFERENCES

- Blaauw, A.: 1963, in K.A. Strand (ed.) "Basic Astronomical Data", University Press, Chicago, p. 383.
 Feinstein, A., Marraco, H.G., and Muzzio, J.C.: 1973, *Astrophys. J. Supp.* 12, 331.
 Harris, G.L.H.: 1976, *Astrophys. J.* 30, 451.
 Humphreys, R.M., Stecker, D.W., and Ney, E.P.: 1972, *Astrophys. J.* 172, 75.
 Walborn, N.R.: 1973, *Astrophys. J.* 179, 517.

DISCUSSION

FEAST: It wasn't clear to me how you differentiated between the filled circles and the open circles in your last two diagrams for NGC 6611. How did you decide which star was a filled circle and which star was an open circle?

FEINSTEIN: Well, just from the evolutionary curve. The stars which in the $(V=M_V, V_0)$ diagram that are below the evolutionary curve are assumed to be in the contracting phase.

FEAST: Just from the position in that one diagram?

FEINSTEIN: Exactly.

LYNGA: That was NGC 6611?

FEINSTEIN: Yes. I want to compare NGC 6611 with the stars in Trumpler 14 and 16 in order to see their differences because they are all very young.

WALLERSTEIN: Where are Walborn's O3 stars?

FEINSTEIN: Here in Trumpler 16. They are not on the main sequence.

WALLERSTEIN: You mean the O3 stars are above the main sequence?

FEINSTEIN: If you look at the $V_0, (B-V)_0$ diagram you will see that the O3 stars are just to the right.

SEGGEWISS: Is there any physical meaning of that distribution of clusters with early spectral types or is it only by chance?

FEINSTEIN: I understand that there are some ideas about supernovae explosion in the formation of clusters.

BLAAUW: Is there a relation between these earliest types and the position of these pre-main-sequence stars in NGC 6611?

FEINSTEIN: I don't know anything about that.

BLAAUW: Well, you would expect that there might be some correlation between the two.

FEINSTEIN: I didn't find contracting stars in Trumpler 14 or 16.

BLAAUW: Oh, I see.

FEINSTEIN: The later type stars or the fainter stars I observed are still on the main-sequence. Perhaps it is necessary to observe fainter stars, in the range of V^v13-15 .

BLAAUW: Thank you.