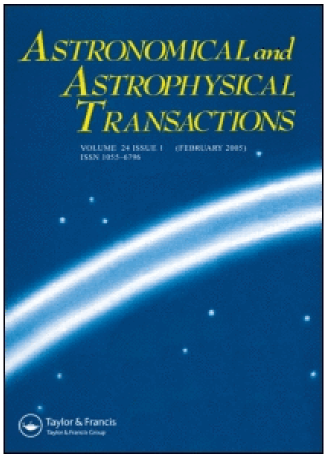

Astronomical & Astrophysical Transactions
The Journal of the Eurasian Astronomical Society
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713453505

# The characteristics of open star clusters from UBV data

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To cite this Article: Loktin, A. V. and Matkin, N. V. (1994) 'The characteristics of open star clusters from UBV data', Astronomical & Astrophysical Transactions, 4:3, 153 - 165
To link to this article: DOI: 10.1080/10556799408205372
URL: http://dx.doi.org/10.1080/10556799408205372

*Astronomical and Astrophysical Transactions*, 1994,
Vol. 4, pp. 153–165
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# THE CHARACTERISTICS OF OPEN STAR CLUSTERS FROM UBV DATA

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*(30 October 1992)*

A catalogue of homogeneous characteristics of open clusters is presented. The values of the color excess, distance, age and, in some cases, metallicity, are determined from published UBV data for 330 objects using a unique computer program. A brief description of this program is given.

KEY WORDS Open clusters, photometrical characteristics, catalogue.

The main characteristics of open clusters (OCL), such as reddening, distance from the Sun and age are usually estimated from the results of photometry of cluster stars. There is no need to discuss the role of open clusters in the investigation of galactic structure and stellar evolution. But the inhomogeneity of the available data make this tool not as powerful as it can be. The existing compilative catalogues of cluster characteristics, such as that of Janes and Adler (1982, hereafter JA) or Lynga (1985) consist of inhomogeneous data and cannot provide adequate information, for example, for the investigation of the spiral structure of the Galaxy (Mdzinarishvili, 1990). This is the motivation of our approach to photometric data aimed at the estimation of reddening, distances and ages of OCL in order to obtain a large but homogeneous set of such characteristics for as many objects as possible. Such approach, after the accumulation of photometric data, can provide in future the possibility of a fast reevaluation of the characteristics of a large number of clusters using new sets of theoretical isochrones, reddening lines or corrections to the distance scale.

The first photometric system we have to use for our purpose is the UBV system of Johnson and Morgan (see Straizis, 1977) because of a great amount of data accumulated since the time when this system was proposed. Cameron (1985a, b, c) was the first to use a computer program to evaluate cluster characteristics from UBV data. However, this program is very sensitive to the quality of data and the influence of nonmembers, and Cameron could consider only a few dozens of clusters for which photoelectric photomery data were available. In his program, the distance modulus was evaluated by the ZAMS fitting and the brightest cluster stars, evolved from ZAMS, cannot be used for this purpose. We attemped to construct a new program in order to avoid some difficulties of this kind for a better use of the existing observational data.

Our aim was to prepare a computer program allowing to estimate characteristics of open cluster, such as reddening, distance from the Sun and age, from photometric data of any quality, including photographic photometry in the presence of nonmembers.

For the estimation of reddening we used the common procedure of a best-fit on a two-color diagram with a sequence of dereddened stars by shifting points along appropriate reddening lines. The best fit is fixed by the minimization of the sum of deviations of the (U–B) color index. In order to diminish the influence of nonmembers we consider the sum of the deviations raised to a power less than two. This well-known robust method is more appropriate than the least squares method in the case of an asymmetric distribution of the deviations (see, for example, Loktin, 1991), which is often the case for photometric diagrams of the OCL in the presence of nonmembers.

For the reddening lines, we use the expression of the form

$$E(\mathrm{U{-}B}) = (0.72 + 0.05 \cdot E(\mathrm{B{-}V})) \cdot E(\mathrm{B{-}V}), \qquad (1)$$

where the values of numerical coefficients have been taken from Straizis (1977) for main sequence (MS) stars. Red giants are excluded from the samples because of their different behavior on the two-color diagram and severe difficulties with specifying their photometrical membership. Individual determinations of reddening is used for blue stars, for which the reddening line intersects only once the zero reddening sequence on the two-color diagram. This procedure diminishes the influence of the differential reddening, that is often noticeable in young OCL.

In order to estimate the metallicities [Fe/H] and account for the blanketing effect in the determination of the reddening we solved our problem for a set of zero-reddening sequences, calibrated in metallicity, taken from Cameron (1985a). Minimum of the sum of deviations then provides a simultaneous estimate of the reddening and metallicity. Our program tries to estimate the metallicity only for the clusters with $\log t > 8.0$ and having more than 30 MS stars in the interval $0.2 < (\mathrm{B{-}V})_0 < 1.0$. When metallicity is determined, the values of color indices are changed with allowance for the blanketing effect in order to use further the unique set of isochrones for all clusters.

With the estimated value of color excess, UBV magnitudes were dereddened with the ratio of the total to selective absorption

$$R = A_V / E(\mathrm{B{-}V}) = 3.34 + 0.18 \cdot (\mathrm{B{-}V})_0 + 0.027 \cdot E(\mathrm{B{-}V}). \qquad (2)$$

This expression was evaluated from the data of Straizis (1977) for MS stars. For the estimation of true distance moduli of the OCL we decided to use the best fit of appropriate theoretical isochrone in order to get simultaneous estimates of distance and age. Fitting theoretical isochrones was nearly equivalent to empirical isochrone fitting proposed by Mermilliod. The set of isochrones used by our program consists of 15 curves taken from Mermilliod and Maeder (1986), Heilesen (1980) and Vandenbergh (1985) and cover the age interval from 0 to $15 \cdot 10^9$ years, all isochrones were taken to have the near-solar metallicity. Lower (on the HR-diagram) parts of the youngest isochrones were replaced by those calculated by Iben for contracting pre-MS stars. In every case we need, the values from Bohm-Vitense (1981) were used to connect effective temperatures and color indices, and for bolometric corrections we chose the values from Malagnini *et al.* (1986).

We shifted the luminosity scale of our isochrone set by $+0\overset{m}{.}15$ in order to link our distance scale with the value of the Hyades cluster distance modulus, $3\overset{m}{.}42$ (Loktin and Matkin, 1989). This value was recently confirmed by Shwan (1991) in his precise treatment of the Hyades cluster member proper motions using the convergence point method.

It is well known that the color index (B–V) for blue stars is a poor measure of the effective temperature, and the MS on the HR-diagram of young star clusters is nearly vertical, which leads to a poor accuracy of the fitting procedure. In order to account for this effect, we use the color index (U–V) for young clusters (with the age logarithms $\log t < 8.2$), which has an advantage of a wider wavelength base compared with the color index (U–B) commonly used in this case.

For our purpose of composing a new homogeneous catalogue, we collected 553 sets of published UBV data for 330 clusters from nearly 340 sources. Some other data sets were not included in our sample because of shapeless cluster photometrical diagrams. All the sources for an individual cluster were processed by the program separately. We did not try to bring all cluster photometrical data in one system because it seems that the errors of the fitting procedure were larger than any systematic error of photometry. After the data processing, all the estimates for a particular cluster were averaged.

A catalogue of the OCL characteristics presented here in Table 3 contains the estimates of the mean color excess $E$(B–V), distance from the Sun, age logarithm and, in some cases, metallicity [Fe/H]. Objects in the catalogue are arranged in ascending order of galactic longitude, the designations of columns is straightforward. The last column contains also the number of the sources of photometry used.

Two samples taken from this catalogue have been already used by the authors in their investigations of Cepheid variables in OCLs (Matkin, 1991) and the spiral structure parameters of the Galaxy (Loktin and Matkin, 1992). These investigations provide upper estimates of the mean errors of distance moduli and age logarithms in our catalogue. Both the values of the dispersion of points on the luminosity-period and age-period diagrams in the paper of Matkin (1991) and results of numerical simulation of the errors of the spiral structure parameters in Loktin and Matkin (1992) give upper estimates of the mean errors equal to $0\overset{m}{.}2$ in distance modulus and 0.20 in age logarithm. These values can be regarded as the upper limits of the mean external errors of the catalogue values.

In contrast to the upper estimates of the errors, Tables 1 and 2 demonstrate a

**Table 1** Individual estimates of the characteristics of the open cluster NGC6530

| $(V-M_V)_0$ | $\log t$ | $E$(B–V) | References |
|---|---|---|---|
| 10.882 | 6.756 | 0.360 | Kilambi, 1977 |
| 11.090 | 6.724 | 0.351 | Walker, 1957 |
| 10.761 | 6.706 | 0.330 | Chini *et al.*, 1981 |
| 10.944 | 6.710 | 0.370 | Sagar *et al.*, 1978 |
| 10.923<br>±0.070 | 6.724<br>±0.011 | 0.352<br>±0.013 | |

**Table 2** Individual estimates of the characteristics for the open cluster M67 (NGC2682)

| $(V-M_V)_0$ | $\log t$ | $E(B-V)$ | [Fe/H] | *References* |
|---|---|---|---|---|
| 9.578 | 9.703 | 0.078 | −0.07 | Sanders, 1989 |
| 9.374 | 9.762 | 0.083 | −0.10 | Eggen, 1964 |
| 9.577 | 9.705 | 0.067 | −0.04 | Racine, 1971 |
| 9.528 | 9.732 | 0.058 | −0.02 | Gilliland, 1991 |
| 9.514<br>±0.050 | 9.723<br>±0.016 | 0.072<br>±0.006 | −0.06<br>±0.02 | |

good agreement between the characteristics determined from various data sources for one very young (NGC6530) and one old (M67) cluster. In the lower two rows of the tables, the mean values of the respective characteristics are given with their standard deviations.

In order to compare our results with those published earlier, we decided to use the values from the catalogues of Bekker and Fenkart (1971) and Fenkart and Binggeli (1979), the choice of these sources was directed by the data homogeneity in these catalogues. The comparison of the estimates of color excesses $E(B-V)$ is shown in Figure 1. The scatter on the plot of Figure 1 is large and some clusters deviate from the mean line noticeably, but the bulk of the scatter can be accounted for by differential reddening in some clusters. Any systematical difference is obviously absent. It can be mentioned that most of clusters with large deviations (except NGC6913) have low weight of input data.

The same picture one can see in Figure 2, where the comparison between the distance estimates of the two sets of data is shown. One can see from that the distance scales of the two catalogues are nearly identical.

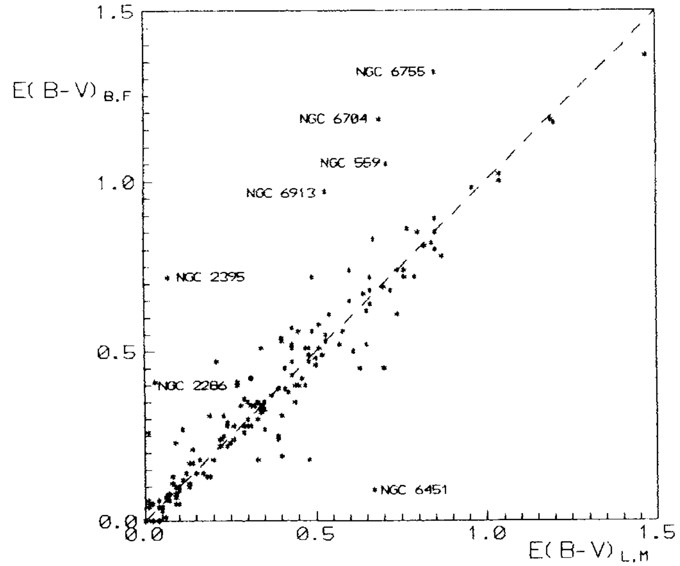

**Figure 1** Comparison between the color excesses derived by Bekker and Fenkart (1971) and in this paper. Clusters with the largest deviations are labelled by their names.

**Table 3** A catalogue of photometrical characteristics of 330 open clusters

| *N* | Cluster | *l* | *b* | *E*(B–V) | *Dist. pc* | log *t* | [Fe/H] | *N. ref.* |
|---|---|---|---|---|---|---|---|---|
| 1 | NGC6520 | 2.3 | −2.9 | 0.44 | 1568 | 8.14 | — | 1 |
| 2 | NGC6530 | 6.1 | −1.4 | 0.35 | 1535 | 6.72 | — | 4 |
| 3 | Bo14 | 6.5 | −0.6 | 1.54 | 807 | 6.88 | — | 1 |
| 4 | NGC6514 | 7.0 | −0.3 | 0.21 | 964 | 7.48 | — | 1 |
| 5 | NGC6546 | 7.3 | −1.4 | 0.55 | 927 | 7.88 | — | 1 |
| 6 | NGC6531 | 7.7 | −0.4 | 0.30 | 1285 | 6.97 | — | 1 |
| 7 | NGC6494 | 9.9 | 2.9 | 0.35 | 475 | 8.53 | — | 1 |
| 8 | Anonym (WZ Sgr) | 12.1 | −1.3 | 0.53 | 1169 | 7.80 | — | 1 |
| 9 | IC4725 | 13.6 | −4.5 | 0.48 | 633 | 7.94 | — | 4 |
| 10 | NGC6613 | 14.2 | −1.0 | 0.47 | 1408 | 7.30 | — | 1 |
| 11 | Cr394 | 14.7 | −9.0 | 0.25 | 664 | 7.86 | — | 1 |
| 12 | NGC6716 | 15.4 | −9.6 | 0.14 | 684 | 7.92 | — | 2 |
| 13 | NGC6611 | 17.0 | 0.8 | 0.76 | 2089 | 6.10 | — | 5 |
| 14 | NGC6604 | 18.3 | 1.7 | 1.02 | 2376 | 5.93 | — | 2 |
| 15 | NGC6649 | 21.6 | −0.8 | 1.37 | 1337 | 7.69 | — | 4 |
| 16 | NCG6694 | 23.9 | −2.9 | 0.67 | 1426 | 7.85 | — | 2 |
| 17 | NGC6664 | 24.0 | −0.5 | 0.66 | 1117 | 7.77 | — | 1 |
| 18 | NGC6705 | 27.3 | −2.8 | 0.42 | 1794 | 8.25 | −0.22: | 2 |
| 19 | NGC6704 | 28.2 | −2.2 | 0.69 | 2770 | 7.95 | — | 1 |
| 20 | Tr35 | 28.3 | 0.0 | 1.19 | 1269 | 7.51 | — | 2 |
| 21 | Cr359 | 29.8 | 12.5 | 0.19 | 188 | 7.47 | — | 1 |
| 22 | IC4665 | 30.6 | 17.1 | 0.19 | 344 | 7.58 | — | 3 |
| 23 | NGC6633 | 36.1 | 8.3 | 0.16 | 383 | 8.66 | −0.07 | 1 |
| 24 | IC4756 | 36.4 | 5.3 | 0.20 | 480 | 8.78 | +0.21 | 2 |
| 25 | NGC6755 | 38.6 | −1.7 | 0.85 | 1563 | 7.78 | — | 2 |
| 26 | NGC6709 | 42.2 | 4.7 | 0.32 | 946 | 8.01 | — | 1 |
| 27 | Be82 | 46.8 | 1.6 | 1.04 | 917 | 7.67 | — | 1 |
| 28 | NGC6802 | 55.4 | 0.9 | 0.85 | 826 | 9.41 | −0.66 | 1 |
| 29 | Harvard2 | 56.3 | −4.7 | 0.26 | 1617 | 7.15 | — | 1 |
| 30 | NCG6823 | 59.4 | −0.1 | 0.85 | 2184 | 6.55 | — | 6 |
| 31 | NGC6830 | 60.1 | −1.8 | 0.51 | 1544 | 7.76 | — | 1 |
| 32 | NGC6834 | 65.7 | 1.2 | 0.74 | 2146 | 7.72 | — | 2 |
| 33 | Ros4 | 67.0 | −1.3 | 0.92 | 2629 | 7.33 | — | 1 |
| 34 | NGC6940 | 69.9 | −7.2 | 0.23 | 1042 | 8.94 | — | 2 |
| 35 | Ros5 | 71.4 | 0.3 | 0.09 | 354 | 7.63 | — | 1 |
| 36 | NGC6871 | 72.6 | 2.1 | 0.47 | 1519 | 6.95 | — | 1 |
| 37 | Bjurakan | 72.8 | 1.4 | 0.37 | 1317 | 7.14 | — | 1 |
| 38 | NGC6819 | 74.0 | 8.5 | 0.21 | 1689 | 9.40 | — | 2 |
| 39 | IC4996 | 75.4 | 1.3 | 0.66 | 1842 | 7.00 | — | 1 |
| 40 | Be86 | 76.7 | 1.3 | 0.92 | 938 | 7.03 | — | 1 |
| 41 | NCG6913 | 76.9 | 0.6 | 0.53 | 1262 | 7.19 | — | 2 |
| 42 | NGC6866 | 79.4 | 6.8 | 0.12 | 1490 | 8.82 | +0.10: | 1 |
| 43 | NGC6811 | 79.4 | 12.0 | 0.13 | 1292 | 8.81 | — | 2 |
| 44 | NGC7063 | 83.1 | −9.9 | 0.09 | 764 | 8.42 | −0.16: | 1 |
| 45 | NGC7039 | 88.0 | −1.7 | 0.16 | 1496 | 8.38 | — | 2 |
| 46 | IC1369 | 89.6 | −0.4 | 0.60 | 988 | 9.16 | — | 1 |
| 47 | NGC7062 | 89.9 | −2.7 | 0.41 | 1997 | 8.63 | — | 3 |
| 48 | NGC7067 | 91.2 | −1.7 | 0.77 | 1210 | 7.33 | — | 2 |
| 49 | NGC7082 | 91.2 | −3.0 | 0.23 | 1332 | 8.45 | — | 1 |
| 50 | NGC7031 | 91.3 | 2.3 | 0.84 | 939 | 8.25 | — | 2 |
| 51 | NGC7092 | 92.5 | −2.3 | 0.01 | 349 | 8.61 | +0.08 | 4 |
| 52 | IC5146 | 94.4 | −5.5 | 0.50 | 975 | 7.96 | — | 1 |
| 53 | NGC7086 | 94.4 | 0.2 | 0.70 | 1183 | 7.88 | — | 2 |
| 54 | NGC7209 | 95.5 | −7.3 | 0.14 | 905 | 8.69 | — | 1 |

**Table 3** (*Cont.*)

| *N* Cluster | *l* | *b* | *E*(B–V) | *Dist. pc* | log *t* | [Fe/H] | *N. ref.* |
|---|---|---|---|---|---|---|---|
| 55 NGC7128 | 97.4 | 0.4 | 1.04 | 3147 | 7.33 | — | 1 |
| 56 NGC7243 | 98.9 | −5.6 | 0.24 | 739 | 7.90 | — | 2 |
| 57 Tr37 | 99.3 | 3.7 | 0.47 | 770 | 7.23 | — | 3 |
| 58 NGC7226 | 101.4 | −0.6 | 0.47 | 2612 | 8.80 | — | 1 |
| 59 NGC7245 | 101.4 | −1.9 | 0.44 | 1598 | 8.22 | — | 1 |
| 60 NGC7235 | 102.7 | 0.8 | 0.96 | 3372 | 6.95 | — | 2 |
| 61 Be94 | 103.1 | −1.2 | 0.67 | 3946 | 6.78 | — | 1 |
| 62 Be96 | 103.7 | −2.1 | 0.63 | 4057 | 6.73 | — | 1 |
| 63 NGC7160 | 104.0 | 6.5 | 0.40 | 774 | 7.37 | — | 3 |
| 64 NGC7261 | 104.0 | 0.9 | 1.04 | 1491 | 7.47 | — | 1 |
| 65 NGC7142 | 105.4 | 9.5 | 0.40 | 987 | 9.86 | −0.45: | 2 |
| 66 NGC7380 | 107.1 | −0.9 | 0.60 | 2860 | 6.96 | — | 2 |
| 67 Ba2 | 110.6 | 0.2 | 0.48 | 1387 | 9.27 | — | 1 |
| 68 Ba3 | 111.4 | 0.2 | 0.91 | 2536 | 6.94 | — | 1 |
| 69 Mark50 | 111.4 | −0.2 | 0.73 | 1645 | 7.46 | — | 1 |
| 70 NGC7654 | 112.8 | 0.5 | 0.65 | 1490 | 7.72 | — | 3 |
| 71 Stock17 | 115.3 | 0.1 | 0.80 | 3082 | 6.51 | — | 1 |
| 72 King21 | 115.9 | 0.7 | 0.86 | 2796 | 7.22 | — | 1 |
| 73 King12 | 116.1 | −0.1 | 0.61 | 2719 | 7.06 | — | 1 |
| 74 NGC7788 | 116.4 | −0.8 | 0.30 | 2528 | 7.52 | — | 1 |
| 75 NGC7790 | 116.6 | −1.0 | 0.53 | 3026 | 7.74 | — | 3 |
| 76 NGC7762 | 117.2 | 5.8 | 0.76 | 728 | 9.23 | — | 1 |
| 77 NGC103 | 119.8 | −1.4 | 0.45 | 2810 | 7.85 | — | 1 |
| 78 NGC129 | 120.3 | −2.6 | 0.54 | 1595 | 7.79 | — | 3 |
| 79 King14 | 120.7 | 0.4 | 0.43 | 2340 | 7.82 | — | 1 |
| 80 NGC146 | 120.9 | 0.5 | 0.49 | 2563 | 7.60 | — | 1 |
| 81 NGC225 | 122.0 | −1.1 | 0.24 | 624 | 8.24 | — | 1 |
| 82 NGC188 | 122.8 | 22.5 | 0.09 | 1675 | 9.82 | +0.07 | 1 |
| 83 Be62 | 124.0 | 1.1 | 0.85 | 2513 | 7.22 | — | 1 |
| 84 NGC381 | 124.9 | −1.2 | 0.34 | 1089 | 8.47 | −0.52: | 1 |
| 85 NGC436 | 126.1 | −3.9 | 0.48 | 2942 | 7.78 | — | 1 |
| 86 NGC457 | 126.6 | −4.4 | 0.48 | 2796 | 7.15 | — | 3 |
| 87 NGC559 | 127.2 | 0.8 | 0.71 | 1268 | 7.65 | — | 2 |
| 88 Cr463 | 127.4 | 9.6 | 0.24 | 350 | 8.85 | — | 1 |
| 89 NGC581 | 128.0 | −1.8 | 0.44 | 2241 | 7.13 | — | 4 |
| 90 Tr1 | 128.2 | −1.1 | 0.63 | 2520 | 7.43 | — | 3 |
| 91 NGC637 | 128.5 | 1.7 | 0.76 | 1944 | 6.81 | — | 1 |
| 92 NGC654 | 129.1 | −0.4 | 0.85 | 2422 | 7.08 | — | 7 |
| 93 NGC659 | 129.3 | −1.5 | 0.66 | 2027 | 7.63 | — | 2 |
| 94 NGC663 | 129.5 | −1.0 | 0.82 | 2284 | 7.13 | — | 3 |
| 95 NGC744 | 132.4 | −6.2 | 0.45 | 1188 | 7.99 | — | 1 |
| 96 Ba10 | 134.2 | −2.6 | 0.89 | 2113 | 7.59 | — | 2 |
| 97 NGC869 | 134.6 | −3.7 | 0.58 | 2115 | 7.10 | — | 3 |
| 98 IC1805 | 134.7 | 1.0 | 0.80 | 2195 | 6.67 | — | 3 |
| 99 Mark6 | 134.7 | 0.0 | 0.62 | 674 | 6.74 | — | 1 |
| 100 NGC884 | 135.1 | −3.6 | 0.58 | 2487 | 6.90 | — | 3 |
| 101 Czernik1 | 135.7 | 2.3 | 0.66 | 3869 | 7.80 | — | 1 |
| 102 Be65 | 135.8 | 0.3 | 1.15 | 3020 | 6.71 | — | 1 |
| 103 NGC1027 | 135.8 | 1.5 | 0.31 | 765 | 8.38 | +0.06: | 1 |
| 104 Czernik8 | 135.8 | −1.6 | 0.90 | 1001 | 8.12 | — | 1 |
| 105 King4 | 136.0 | −1.2 | 0.96 | 2866 | 7.62 | — | 2 |
| 106 NGC957 | 136.2 | −2.7 | 0.87 | 1703 | 6.87 | — | 2 |
| 107 NGC752 | 137.2 | −23.4 | 0.05 | 364 | 9.43 | −0.25 | 2 |
| 108 IC1848 | 137.2 | 0.1 | 0.61 | 2472 | 6.89 | — | 1 |
| 109 Tr2 | 137.4 | −3.9 | 0.34 | 556 | 8.12 | −0.05: | 1 |

**Table 3** (*Cont.*)

| *N* Cluster | *l* | *b* | *E*(B−V) | Dist. pc | log *t* | [Fe/H] | *N. ref.* |
|---|---|---|---|---|---|---|---|
| 110 NGC1039 | 143.6 | −15.6 | 0.10 | 501 | 8.26 | — | 2 |
| 111 NGC1502 | 143.6 | 7.6 | 0.74 | 900 | 7.03 | — | 4 |
| 112 NGC1245 | 146.6 | −8.9 | 0.31 | 2608 | 9.16 | −0.34: | 2 |
| 113 Mel20 (α Per) | 147.0 | −7.1 | 0.09 | 170 | 7.90 | — | 1 |
| 114 IC361 | 147.5 | 5.7 | 0.82 | 507 | 8.20 | — | 1 |
| 115 NGC1444 | 148.2 | −1.3 | 0.60 | 1059 | 8.56 | — | 1 |
| 116 NGC1528 | 152.0 | 0.3 | 0.30 | 743 | 8.57 | −0.27: | 1 |
| 117 NGC1545 | 153.4 | 0.2 | 0.29 | 767 | 8.45 | — | 1 |
| 118 NGC1342 | 155.0 | −15.4 | 0.26 | 531 | 8.71 | −0.06: | 1 |
| 119 Be11 | 157.1 | −3.7 | 0.91 | 2359 | 7.54 | — | 1 |
| 120 NGC1664 | 161.7 | −0.5 | 0.24 | 1697 | 8.51 | +0.15: | 1 |
| 121 Pleiades | 166.6 | −23.5 | 0.04 | 126 | 7.92 | — | 1 |
| 122 Cz20 | 168.3 | 1.3 | 0.45 | 4019 | 7.10 | — | 1 |
| 123 NGC1778 | 168.9 | −2.0 | 0.34 | 1477 | 8.06 | — | 3 |
| 124 NGC1912 | 172.3 | 0.7 | 0.26 | 1118 | 8.48 | −0.29: | 1 |
| 125 NGC1907 | 172.6 | 0.3 | 0.43 | 1486 | 8.61 | — | 2 |
| 126 Stock8 | 173.4 | −0.2 | 0.42 | 1266 | 7.51 | — | 1 |
| 127 NGC1893 | 173.6 | −1.7 | 0.49 | 3879 | 7.00 | — | 2 |
| 128 NGC1931 | 173.9 | 0.3 | 0.58 | 2036 | 7.13 | — | 1 |
| 129 NGC1960 | 174.5 | 1.0 | 0.22 | 1285 | 7.50 | — | 2 |
| 130 NGC2281 | 175.0 | 17.1 | 0.10 | 528 | 8.36 | −0.42: | 3 |
| 131 NGC2099 | 177.7 | 3.1 | 0.28 | 1356 | 8.50 | — | 3 |
| 132 Hyades | 180.1 | −22.4 | 0.01 | 48 | 8.80 | +0.15 | 1 |
| 133 NGC1647 | 180.4 | −16.8 | 0.41 | 509 | 8.22 | +0.19: | 2 |
| 134 NGC1817 | 186.1 | −13.1 | 0.30 | 2132 | 8.87 | — | 2 |
| 135 NGC2129 | 186.6 | 0.1 | 0.72 | 1540 | 7.01 | — | 1 |
| 136 NGC2168 | 186.6 | 2.2 | 0.25 | 846 | 8.00 | — | 2 |
| 137 NGC1662 | 187.7 | −21.1 | 0.34 | 395 | 8.47 | −0.39: | 2 |
| 138 NGC2175 | 190.2 | 0.4 | 0.60 | 1894 | 6.71 | — | 1 |
| 139 Orion | 195.1 | −12.0 | 0.05 | 399 | 7.11 | — | 1 |
| 140 NGC2169 | 195.6 | −2.9 | 0.19 | 1028 | 7.18 | — | 2 |
| 141 NGC2420 | 198.1 | 19.7 | 0.00 | 2464 | 9.32 | — | 1 |
| 142 NGC2264 | 202.9 | 2.2 | 0.06 | 752 | 6.99 | — | 4 |
| 143 NGC2251 | 203.6 | 0.1 | 0.22 | 1293 | 8.31 | −0.44: | 2 |
| 144 NGC2186 | 203.6 | −6.2 | 0.27 | 1693 | 8.17 | — | 1 |
| 145 NGC2236 | 204.4 | −1.7 | 0.34 | 3086 | 8.99 | −0.07: | 1 |
| 146 NGC2395 | 204.6 | 14.0 | 0.07 | 607 | 9.16 | — | 1 |
| 147 Praesepe | 205.5 | 32.5 | 0.02 | 179 | 8.84 | +0.01 | 1 |
| 148 NGC2244 | 206.4 | −2.0 | 0.48 | 1640 | 6.80 | — | 4 |
| 149 Cr96 | 208.0 | −3.4 | 0.51 | 930 | 7.30 | — | 1 |
| 150 NGC2269 | 208.0 | 0.4 | 0.40 | 1465 | 8.39 | — | 1 |
| 151 Anonym (CV Mon) | 208.6 | −1.8 | 0.68 | 1679 | 7.49 | — | 1 |
| 152 Do25 | 211.9 | −1.3 | 0.81 | 5237 | 7.11 | — | 1 |
| 153 Bo2 | 212.1 | −1.3 | 0.86 | 3792 | 6.56 | — | 1 |
| 154 NGC2301 | 212.6 | 0.3 | 0.04 | 857 | 8.19 | −0.65: | 2 |
| 155 NGC2324 | 213.5 | 3.3 | 0.04 | 4353 | 8.85 | −0.05: | 1 |
| 156 NGC2232 | 214.4 | −7.7 | 0.03 | 316 | 7.59 | — | 1 |
| 157 Bo1 | 214.5 | 2.1 | 0.55 | 4318 | 6.55 | — | 1 |
| 158 NGC2286 | 215.3 | −2.3 | 0.03 | 2191 | 9.21 | — | 1 |
| 159 NGC2682 | 215.6 | 31.7 | 0.07 | 803 | 9.72 | −0.06 | 4 |
| 160 NGC2302 | 219.3 | −3.1 | 0.23 | 1176 | 7.90 | — | 1 |
| 161 Coma | 221.1 | 84.1 | 0.01 | 83 | 8.69 | −0.19 | 1 |
| 162 NGC2323 | 221.7 | −1.2 | 0.23 | 997 | 8.00 | — | 1 |

**Table 3** (*Cont.*)

| *N* Cluster | *l* | *b* | *E*(B–V) | *Dist. pc* | log *t* | [Fe/H] | *N. ref.* |
|---|---|---|---|---|---|---|---|
| 163 NGC2335 | 223.6 | −1.3 | 0.37 | 1384 | 8.13 | — | 2 |
| 164 NGC2343 | 224.3 | −1.2 | 0.15 | 874 | 7.36 | — | 2 |
| 165 NGC2345 | 226.6 | −2.3 | 0.59 | 1947 | 7.56 | — | 1 |
| 166 Ha8 | 227.7 | 1.3 | 0.03 | 1182 | 9.16 | −0.52: | 1 |
| 167 NGC2548 | 227.9 | 15.4 | 0.00 | 664 | 8.54 | — | 1 |
| 168 Ba11 | 228.3 | −0.8 | 0.09 | 897 | 9.13 | — | 1 |
| 169 Bo4 | 228.4 | 1.1 | 0.20 | 849 | 7.57 | — | 1 |
| 170 NGC2374 | 228.4 | 1.0 | 0.01 | 909 | 9.20 | −0.57: | 1 |
| 171 Mel71 | 229.0 | 4.5 | 0.00 | 3162 | 8.45 | — | 1 |
| 172 NGC2360 | 229.8 | −1.4 | 0.09 | 1459 | 9.95 | +0.15: | 1 |
| 173 NGC2423 | 230.5 | 3.5 | 0.04 | 782 | 8.76 | — | 1 |
| 174 NGC2506 | 230.6 | 9.9 | 0.13 | 3122 | 9.07 | — | 2 |
| 175 NGC2422 | 231.0 | 3.1 | 0.07 | 426 | 7.78 | — | 2 |
| 176 NGC2287 | 231.1 | −10.2 | 0.02 | 655 | 8.40 | +0.05 | 4 |
| 177 NGC2414 | 231.4 | 2.0 | 0.57 | 4130 | 6.79 | — | 1 |
| 178 NGC2437 | 231.9 | 4.1 | 0.16 | 1491 | 8.40 | — | 1 |
| 179 NGC2539 | 234.7 | 11.1 | 0.08 | 1477 | 8.77 | — | 2 |
| 180 Cr121 | 235.4 | −10.4 | 0.09 | 573 | 7.00 | — | 1 |
| 181 NGC2384 | 235.4 | −2.4 | 0.28 | 2581 | 6.92 | — | 2 |
| 182 NGC2367 | 235.6 | −3.9 | 0.31 | 2078 | 6.72 | — | 1 |
| 183 NGC2421 | 236.2 | 0.0 | 0.54 | 2001 | 7.25 | — | 1 |
| 184 NGC2362 | 238.2 | −5.5 | 0.11 | 1503 | 6.77 | — | 2 |
| 185 Tr7 | 238.3 | −3.9 | 0.29 | 1575 | 7.44 | — | 1 |
| 186 NGC2354 | 238.4 | −6.8 | 0.17 | 2089 | 8.80 | — | 1 |
| 187 Ru18 | 239.9 | −5.0 | 0.72 | 1069 | 7.64 | — | 1 |
| 188 NGC2482 | 241.6 | 2.0 | 0.03 | 1008 | 8.54 | — | 1 |
| 189 Ha16 | 242.1 | 0.5 | 0.19 | 3661 | 6.71 | — | 1 |
| 190 Ru36 | 242.6 | −0.3 | 0.14 | 1595 | 8.22 | — | 2 |
| 191 Ha19 | 243.0 | 0.5 | 0.43 | 6149 | 7.00 | — | 1 |
| 192 Tr9 | 243.1 | 1.2 | 0.19 | 2241 | 8.10 | — | 1 |
| 193 Ha18 | 243.1 | 0.4 | 0.64 | 6009 | 6.74 | — | 1 |
| 194 NGC2467 | 243.1 | 0.4 | 0.27 | 1235 | 7.24 | — | 2 |
| 195 NGC2483 | 244.7 | 0.1 | 0.31 | 1653 | 7.14 | — | 1 |
| 196 Ru49 | 244.7 | 2.2 | 0.29 | 1668 | 7.83 | — | 1 |
| 197 Cr140 | 245.2 | −7.9 | 0.04 | 347 | 7.60 | — | 2 |
| 198 Ru44 | 245.8 | 0.5 | 0.65 | 5839 | 6.75 | — | 3 |
| 199 NGC2527 | 246.1 | 1.9 | 0.06 | 605 | 8.83 | — | 1 |
| 200 NGC2439 | 246.4 | −4.4 | 0.39 | 4254 | 7.13 | — | 1 |
| 201 Ha20 | 247.0 | −1.0 | 0.54 | 3309 | 8.10 | — | 1 |
| 202 NGC2533 | 247.8 | 1.3 | 0.01 | 1551 | 9.29 | — | 1 |
| 203 Ha15 | 247.9 | −4.2 | 1.18 | 2810 | 7.02 | — | 1 |
| 204 Cr135 | 248.8 | −11.2 | 0.05 | 276 | 7.54 | — | 1 |
| 205 NGC2571 | 249.1 | −3.6 | 0.19 | 1271 | 7.46 | — | 3 |
| 206 NGC2567 | 249.8 | 3.0 | 0.09 | 1727 | 8.43 | +0.16: | 2 |
| 207 Ru55 | 250.7 | 0.8 | 0.57 | 5110 | 6.77 | — | 2 |
| 208 NGC2451 | 252.4 | −6.7 | 0.04 | 242 | 8.00 | — | 2 |
| 209 NGC2477 | 253.6 | −5.8 | 0.33 | 1796 | 8.95 | — | 1 |
| 210 NGC2546 | 254.9 | −2.0 | 0.13 | 777 | 7.89 | — | 1 |
| 211 Pismis1 | 255.1 | −0.8 | 0.65 | 2210 | 7.95 | — | 1 |
| 212 NGC2818 | 262.0 | 8.6 | 0.18 | 3932 | 8.97 | — | 1 |
| 213 Pismis4 | 262.7 | −2.4 | 0.03 | 601 | 7.61 | — | 1 |
| 213 Tr10 | 262.8 | 0.6 | 0.02 | 338 | 7.58 | — | 1 |
| 215 Ru67 | 262.8 | −0.8 | 0.42 | 1107 | 8.36 | — | 1 |
| 216 NGC2547 | 264.6 | −8.6 | 0.04 | 428 | 7.88 | — | 1 |
| 217 Pismis6 | 264.8 | −2.9 | 0.38 | 1780 | 7.28 | — | 1 |

**Table 3** (*Cont.*)

| *N* Cluster | *l* | *b* | *E*(B–V) | *Dist. pc* | log *t* | [Fe/H] | *N. ref.* |
|---|---|---|---|---|---|---|---|
| 218 Wat6 | 264.9 | −2.8 | 0.29 | 1722 | 7.74 | — | 1 |
| 219 Pismis8 | 265.1 | −2.6 | 0.68 | 1330 | 7.18 | — | 1 |
| 220 IC2395 | 266.6 | −3.8 | 0.08 | 785 | 7.35 | — | 1 |
| 221 NGC2670 | 267.5 | −3.5 | 0.50 | 1014 | 7.73 | — | 1 |
| 222 IC2391 | 270.4 | −6.9 | 0.01 | nn 164 | 7.64 | — | 5 |
| 223 Pismis13 | 273.2 | −0.8 | 0.66 | 2216 | 7.81 | — | 1 |
| 224 NGC2516 | 273.9 | −15.9 | 0.10 | 373 | 7.79 | −0.07: | 4 |
| 225 Ru79 | 277.1 | −0.8 | 0.76 | 2478 | 7.66 | — | 2 |
| 226 IC2488 | 277.8 | −4.4 | 0.23 | 998 | 7.90 | — | 1 |
| 227 NGC3105 | 279.9 | 0.3 | 1.05 | 4672 | 6.96 | — | 2 |
| 228 NGC3228 | 280.7 | 4.6 | 0.03 | 529 | 8.08 | — | 1 |
| 229 Bo8 | 283.2 | −1.4 | 0.52 | 1699 | 7.83 | — | 1 |
| 230 NGC3114 | 283.3 | −3.8 | 0.06 | 893 | 7.93 | — | 1 |
| 231 Westerl.2 | 284.3 | −0.3 | 1.59 | 9882 | 6.62 | — | 1 |
| 232 IC2581 | 284.6 | 0.0 | 0.43 | 2516 | 7.06 | — | 2 |
| 233 NGC3293 | 285.9 | 0.1 | 0.27 | 2458 | 7.03 | — | 3 |
| 234 NGC3324 | 286.2 | −0.2 | 0.46 | 3231 | 6.70 | — | 2 |
| 235 Cr223 | 286.2 | −1.9 | 0.22 | 1944 | 7.55 | — | 1 |
| 236 VdBergh99 | 286.6 | −0.6 | 0.08 | 503 | 7.67 | — | 1 |
| 237 NGC3680 | 286.8 | 16.9 | 0.08 | 735 | 9.53 | −0.23: | 1 |
| 238 Bo10 | 287.1 | −0.3 | 0.34 | 2205 | 6.98 | — | 2 |
| 239 Tr14 | 287.4 | −0.6 | 0.57 | 2996 | 6.67 | — | 3 |
| 240 Tr15 | 287.4 | −0.4 | 0.40 | 1520 | 6.72 | — | 1 |
| 241 Tr16 | 287.6 | −0.7 | 0.52 | 3037 | 6.44 | — | 3 |
| 242 Bo11 | 288.1 | −1.0 | 0.63 | 2990 | 6.63 | — | 2 |
| 243 Tr17 | 288.7 | 0.4 | 0.64 | 1754 | 7.70 | — | 1 |
| 244 Pismis17 | 289.5 | 1.4 | 0.52 | 4117 | 6.96 | — | 1 |
| 245 NGC3496 | 289.6 | −0.4 | 0.47 | 852 | 9.14 | −0.74: | 1 |
| 246 Sher1 | 289.6 | −0.4 | 1.35 | n8938 | 6.59 | — | 1 |
| 247 IC2602 | 289.6 | −4.9 | 0.05 | 164 | 7.36 | — | 3 |
| 248 NGC3532 | 289.6 | 1.5 | 0.04 | 443 | 8.40 | −0.51: | 3 |
| 249 Stock13 | 290.5 | 1.6 | 0.23 | 2914 | 6.87 | — | 1 |
| 250 NGC3572 | 290.7 | 0.2 | 0.48 | 2763 | 6.75 | — | 2 |
| 251 Hogg10 | 290.8 | 0.1 | 0.47 | 2084 | 6.80 | — | 2 |
| 252 Cr240 | 290.8 | 0.2 | 0.43 | 963 | 7.09 | — | 1 |
| 253 Tr18 | 291.0 | −1.4 | 0.35 | 1553 | 7.20 | — | 4 |
| 254 NGC3590 | 291.2 | −0.2 | 0.51 | 2218 | 7.29 | — | 3 |
| 255 NGC3603 | 291.6 | −0.5 | 1.47 | 10950 | 6.40 | — | 3 |
| 256 Mel105 | 292.9 | −2.4 | 0.48 | 2035 | 8.29 | −0.62: | 2 |
| 257 NGC3766 | 294.1 | 0.0 | 0.20 | 1857 | 7.42 | — | 1 |
| 258 IC2944 | 294.6 | −1.4 | 0.33 | 2096 | 6.73 | — | 2 |
| 259 Stock14 | 295.2 | −0.6 | 0.25 | 2364 | 7.01 | — | 3 |
| 260 Ru97 | 296.8 | −0.4 | 0.20 | 1500 | 8.66 | — | 2 |
| 261 Ru98 | 297.2 | −2.2 | 0.15 | 335 | 8.36 | — | 1 |
| 262 NGC4052 | 297.4 | −0.9 | 0.16 | 1138 | 8.74 | — | 1 |
| 263 NGC4103 | 297.6 | 1.2 | 0.29 | 1764 | 7.46 | — | 1 |
| 264 NGC4337 | 299.3 | 4.6 | 0.16 | 464 | 8.51 | — | 1 |
| 265 NGC4349 | 299.8 | 0.8 | 0.39 | 2315 | 8.46 | — | 1 |
| 266 Cr258 | 299.8 | 2.1 | 0.17 | 1010 | 7.76 | — | 1 |
| 267 Hogg14 | 300.1 | 2.9 | 0.26 | 726 | 8.45 | — | 1 |
| 268 NGC4439 | 300.1 | 2.7 | 0.34 | 1706 | 7.79 | — | 2 |
| 269 NGC4463 | 300.7 | −2.0 | 0.44 | 1114 | 7.29 | — | 1 |
| 270 NGC4609 | 301.9 | −0.1 | 0.34 | 1227 | 7.75 | — | 1 |
| 271 NGC4755 | 303.2 | 2.5 | 0.40 | 2105 | 7.26 | — | 4 |
| 272 NGC4815 | 303.6 | −2.1 | 0.78 | 2684 | 8.48 | — | 1 |

**Table 3** (*Cont.*)

| *N* Cluster | *l* | *b* | *E*(B–V) | *Dist. pc* | log *t* | [Fe/H] | *N. ref.* |
|---|---|---|---|---|---|---|---|
| 273 Cr268 | 305.2 | −4.5 | 0.35 | 1972 | 8.34 | — | 1 |
| 274 Stock16 | 306.1 | 0.1 | 0.48 | 1905 | 6.89 | — | 2 |
| 275 Cr271 | 307.1 | −1.6 | 0.25 | 988 | 8.42 | — | 1 |
| 276 Hogg16 | 307.5 | 1.3 | 0.43 | 1686 | 6.97 | — | 2 |
| 277 NGC5138 | 307.6 | 3.6 | 0.26 | 1849 | 7.92 | — | 1 |
| 278 Tr21 | 307.6 | −0.3 | 0.21 | 1220 | 7.65 | — | 2 |
| 279 NGC5168 | 307.8 | 1.6 | 0.66 | 2361 | 8.18 | — | 2 |
| 280 Ru108 | 308.3 | 4.0 | 0.15 | 629 | 8.52 | — | 1 |
| 281 NGC5281 | 309.2 | −0.7 | 0.28 | 1145 | 7.04 | — | 1 |
| 282 NGC5316 | 310.2 | 0.1 | 0.27 | 1330 | 8.16 | — | 2 |
| 283 Ly1 | 310.9 | −0.4 | 0.49 | 1841 | 7.88 | — | 1 |
| 284 Ly2 | 313.8 | −0.5 | 0.23 | 816 | 8.05 | — | 1 |
| 285 NGC5617 | 314.7 | −0.1 | 0.51 | 1537 | 7.57 | −0.25: | 4 |
| 286 Tr22 | 314.7 | −0.6 | 0.53 | 1628 | 7.98 | — | 2 |
| 287 NGC5606 | 314.9 | 1.0 | 0.49 | 1915 | 6.87 | — | 3 |
| 288 Hogg17 | 314.9 | −0.9 | 0.48 | 1208 | 7.85 | — | 1 |
| 289 NGC5460 | 315.8 | 12.6 | 0.12 | 587 | 8.06 | — | 1 |
| 290 NGC5662 | 316.9 | 3.5 | 0.32 | 684 | 8.05 | — | 3 |
| 291 NGC5749 | 319.5 | 4.5 | 0.41 | 1054 | 7.68 | — | 1 |
| 292 Pismis20 | 320.5 | −1.2 | 1.20 | 2037 | 6.38 | — | 3 |
| 293 Hogg18 | 320.8 | 6.4 | 0.52 | 1107 | 7.56 | — | 1 |
| 294 NGC5823 | 321.2 | 2.5 | 0.16 | 726 | 9.02 | — | 2 |
| 295 NGC5822 | 321.7 | 3.6 | 0.14 | 801 | 8.97 | — | 2 |
| 296 NGC6025 | 324.6 | −6.0 | 0.17 | 675 | 7.75 | — | 2 |
| 297 NGC6087 | 327.8 | −5.4 | 0.18 | 866 | 7.91 | — | 2 |
| 298 Lynga7 | 328.8 | −2.8 | 0.31 | 558 | 7.92 | — | 1 |
| 299 NGC6031 | 329.3 | −1.5 | 0.37 | 1674 | 8.17 | −0.36: | 2 |
| 300 NGC6067 | 329.8 | −2.2 | 0.37 | 1703 | 7.97 | — | 2 |
| 301 Lynga6 | 330.4 | 0.3 | 1.36 | 2052 | 7.57 | — | 2 |
| 302 Ru119 | 333.3 | −1.9 | 0.59 | 1046 | 7.16 | — | 1 |
| 303 NGC6134 | 334.9 | −0.2 | 0.38 | 1001 | 9.21 | +0.06: | 2 |
| 304 NGC6167 | 335.3 | −1.3 | 0.79 | 1029 | 7.59 | — | 2 |
| 305 NGC6193 | 336.7 | −1.6 | 0.43 | 1429 | 6.71 | — | 2 |
| 306 NGC6200 | 338.0 | −1.1 | 0.60 | 3306 | 6.94 | — | 1 |
| 307 NGC6178 | 338.4 | 1.2 | 0.23 | 995 | 7.49 | — | 1 |
| 308 NGC6204 | 338.6 | −1.1 | 0.43 | 1126 | 7.92 | −0.11: | 3 |
| 309 Hogg22 | 338.6 | −1.2 | 0.66 | 1681 | 6.74 | — | 1 |
| 310 NGC6208 | 339.7 | −5.8 | 0.15 | 1248 | 9.31 | +0.05: | 1 |
| 311 IC4651 | 340.1 | −7.9 | 0.13 | 789 | 9.52 | −0.13 | 3 |
| 312 NGC6192 | 340.7 | 2.1 | 0.66 | 1466 | 7.96 | — | 1 |
| 313 NGC6124 | 340.8 | 6.0 | 0.76 | 466 | 8.00 | — | 1 |
| 314 NGC6250 | 340.8 | −1.8 | 0.37 | 942 | 7.34 | — | 2 |
| 315 Lynga14 | 340.9 | −1.2 | 1.41 | 1440 | 6.43 | — | 1 |
| 316 NGC6249 | 341.6 | −1.2 | 0.46 | 1020 | 7.36 | — | 1 |
| 317 NGC6231 | 343.5 | 1.2 | 0.44 | 1515 | 6.73 | — | 3 |
| 318 Tr24 | 344.4 | 1.7 | 0.50 | 1222 | 6.93 | — | 1 |
| 319 NGC6322 | 345.3 | −3.0 | 0.61 | 1167 | 6.95 | — | 2 |
| 320 NGC6242 | 345.5 | 2.4 | 0.39 | 1119 | 7.73 | — | 1 |
| 321 NGC6281 | 347.8 | 2.0 | 0.14 | 517 | 8.45 | −0.09 | 2 |
| 322 Bo13 | 351.3 | −2.5 | 0.89 | 1099 | 6.73 | — | 1 |
| 323 Ru127 | 352.9 | −2.5 | 1.01 | 1914 | 7.20 | — | 1 |
| 324 NGC6396 | 354.0 | −1.9 | 0.97 | 1339 | 7.27 | — | 1 |
| 325 NGC6383 | 355.1 | 0.1 | 0.29 | 1254 | 6.78 | — | 5 |
| 326 Tr28 | 356.0 | −0.2 | 0.82 | 1736 | 7.13 | — | 2 |
| 327 NGC6405 | 356.6 | −0.7 | 0.14 | 484 | 8.02 | −0.48: | 5 |
| 328 NGC6416 | 357.0 | −1.5 | 0.24 | 793 | 8.22 | — | 2 |
| 329 NGC6425 | 357.9 | −1.6 | 0.41 | 756 | 7.60 | — | 1 |
| 330 NGC6451 | 359.5 | −1.6 | 0.67 | 1915 | 8.05 | — | 1 |

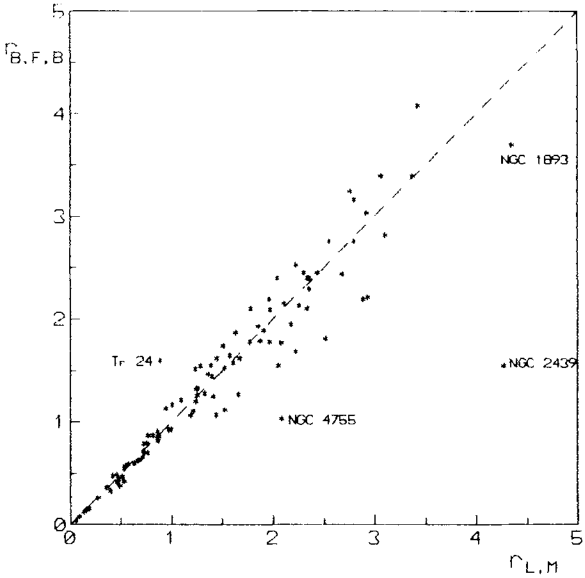

Figure 2 Comparison between cluster distance determinations of this paper and those of Bekker and Fenkart (1971) and Fenkart and Binggeli (1979). Distances are given in kpc. Clusters with the largest deviations are labelled by their names.

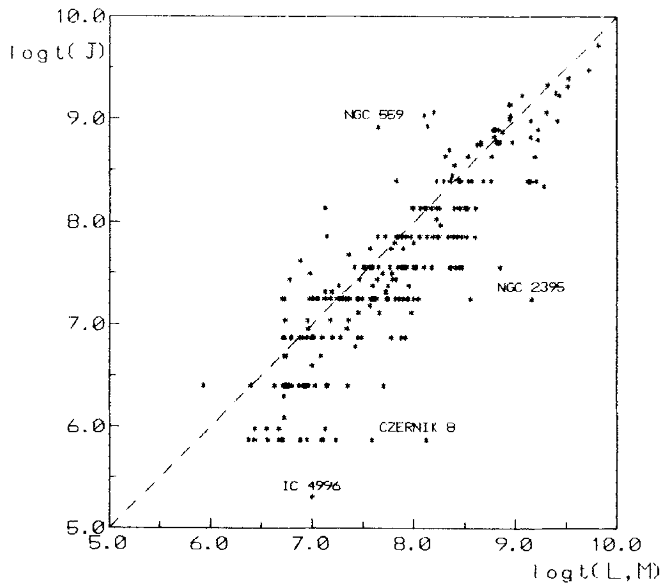

Figure 3 Comparison between age determinations of this paper and those of Janes and Adler (1982). Clusters with the largest deviations are labelled by their names.

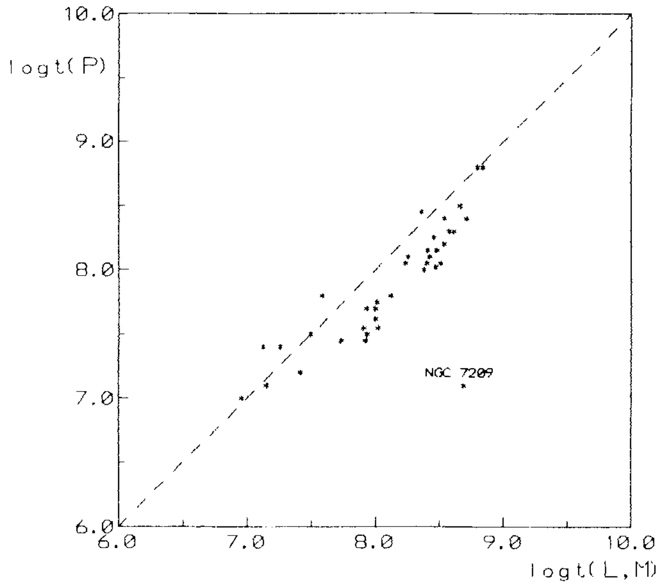

**Figure 4** Comparison between age determinations of this paper and those of Popova and Kraitcheva (1989). Note a small dispersion of points on the graph compared with that in Figure 3.

We also compared the age determinations using the data of JA (shown in Figure 3) and Popova and Kraitcheva (1989) (Figure 4). JA form their set of age determinations using calibration of MS turn-off points (B–V) color indexes. In Figure 3 one can see that the age scales of the two catalogues, ours and that of JA, do not differ much, except the case of the youngest clusters, where the color index (B–V) is a poor measure of the effective temperature. The coincidence of our age determinations with that of Popova and Kraitcheva is good except a clearly seen systematical deviation caused by the choice of a different set of theoretical isochrones. The difference for the youngest clusters may have opposite sign than that in Figure 3. We should mention that the dispersion of points in Figure 3 is large compared with that in Figure 4. This means that a direct comparison of the cluster HR-diagram with theoretical isochrones is a more powerful method of age determination than the use of the calibration of turn-off colors.

The comparison of our new catalogue of open cluster characteristics with several other sources reveals that the one published here is no less precise in both the distance and age estimates of OCL. Being homogeneous in the method used for the estimation of cluster characteristics, it provides a high-quality information for OCL and galactic investigation. A full version of the catalogue including the determination of the characteristics for each source of data separately and all references will be submitted soon to the Strasbourg Data Centre.

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