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Spectroscopic investigations of classical Cepheids and main-sequence stars in galactic open clusters and associations*

II. Open cluster Platais 1 (C2128+488) and small-amplitude Cepheid V1726 Cygni

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Abstract. The small-amplitude Cepheid V1726 Cyg and two members of open cluster Platais 1 (Platais 1 star No. 1 (1921) and Platais 1 star No. 111 (1600)) were investigated, using high-resolution CCD spectra. The following results were obtained: 1) All objects have the same metallicities, close to that of the Sun (for V1726 Cyg weighted average [Fe/H] = +0.05, for Platais 1 star No. 1 (1921) [Fe/H] = +0.13); 2) values of $T_{\rm eff}$ and $\log g$ for the B-stars are in excellent agreement with those determined from $(B-V)$ colour indices using a $(B-V) \sim (T_{\rm eff}, \log g)$ calibration; 3) the elemental abundances indicate that V1726 Cyg is in the post first dredge-up stage with an age near 1.5×10^8, and is crossing the Cepheid instability strip for the third time. Mean values of $T_{\rm eff} = 6100$ K and $\log g = 2.35 \pm 0.05$ permit us to refine its colour excess to $E_{B-V} = 0\overset{\rm m}{.}33$, which for a distance of $d = 1568 \pm 13$ pc corresponds to $M_V = -2\overset{\rm m}{.}99$. The Cepheid could therefore be pulsating in the fundamental tone, although pulsation in the first overtone is not excluded; 4) Platais 1 Star No. 1 (1921) is a slowly rotating HgMn–star with a high helium content, while Platais 1 star No. 111 (1600) is a rapidly rotating main-sequence star with a helium content comparable to that of the Sun; 5) the age of the open cluster is estimated to be about 2.5×10^8 yr.

Key words. galaxy: open clusters: and associations – stars: abundances – stars: Cepheids – stars: general

1. Introduction

In this paper we continue to present the results of spectroscopic investigations of Cepheids and main-sequence (MS) stars in selected Galactic open clusters that was began in Paper I (Usenko et al. 2001). Examined here are three objects belonging to the insufficiently explored open cluster Platais 1 (Platais 1986): the small-amplitude Cepheid (DCEPS) V1726 Cyg and two B-stars.

As in the case of SU Cas, V1726 Cyg is suspected to be an overtone pulsator, according to Turner et al. (1994). Of the other cluster stars, one of the B-stars (star No. 111) is a typical MS object, while the other (star No. 1) is located near the turn-off point for the open cluster. In Paper I we identified in the Cas OB2 association a similar star HD 17327a, located near the turn-off point that is a mercury-manganese star with a very high helium content and a low rotation velocity. Lying closer to the MS, HD 17443 has a helium content close to that of the Sun, along with a high rotational velocity. The question arises: is it a unique case, or can we observe similar stars in other open clusters and associations?

2. Open cluster Platais 1 (C2128+488)

This very poorly studied small cluster was investigated photometrically in detail for the first time by Platais (1986), owing to its spatial proximity to the small-amplitude Cepheid (DCEPS) V1726 Cyg. Subsequent observations by Turner et al. (1994) have shown that

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* Based on the spectra collected with the 6-m telescope SAO RAS.

Table 1. Investigated stars in the open cluster Platais 1 (C2128+488).

Star	V (mag)	$(B–V)$ (mag)	$(U–B)$ (mag)	Spectral type
V1726 Cyg	9.01	0.89	0.58	F6 Ib
No. 1 (1921)	11.15	0.30	0.19	B9 IIIp
No. 111 (1600)	12.54	−0.12	–	B9.5 V

Reference: $(B–V)_0$, $(U–B)_0$ and spectral type data from Turner et al. (1994).

Table 2. Program stars spectra.

Star	Spectrum No.	HJD 2450000+	Region (Å)	Exposure (min)
V1726 Cyg*	s20701	1003.231	4420–7767	20
No. 1 (1921)	s20702	1003.304	4420–7767	30
No. 111 (1600)	s20817	1004.461	4420–7767	54

* – Phase value of $\phi = 0\overset{\mathrm{P}}{.}109$ according to Berdnikov & Pastukhova (1994).

V1726 Cyg is an outlying member of the open cluster. Photoelectric photometry of V1726 Cyg obtained during the last 15 years (Berdnikov 1986, 1986; Pastukhova & Shugarov 1994) did not indicate any obvious evolutionary effects on its pulsation period (Berdnikov & Pastukhova 1994), but more recent studies (Berdnikov et al. 2000; Turner et al. 1999) do provide evidence for an increasing pulsational period in this DCEPS. Nevertheless, the value of $M_V = -3\overset{\mathrm{m}}{.}42$ derived for V1726 Cyg, from the interstellar reddening and distance of Platais 1, implies that the star is pulsating in the *first* overtone mode. On the other hand, according to the colour coefficient β in the PLC relation, it is assumed that V1726 Cyg pulsates in the *fundamental* mode (Turner et al. 1994).

Since Platais 1 contains very faint objects, in addition to V1726 Cyg, we selected two B-stars for observations at the suggestion of Dr. D. G. Turner. Star No. 111 from Turner et al. (1994) (or Platais 1600) is a MS object, not far from the open cluster's turn-off point, while star No. 1 (or Platais 1921) is situated very close to the turn-off point. Turner et al. (1994) suggested that it is a B9 IIIp shell star. Photometric information about the stars is given in Table 1.

3. Observations and method of analysis

High-resolution spectra of the stars were obtained with an échelle spectrometer PFES (Panchuk et al. 1998), installed on the 6 m telescope of the Special Astrophysical Observatory of the Russian Academy of Sciences (Russia, Northern Caucasus). The spectra contained 23 orders, with an average resolving power $R \sim 14\,000$, and a signal-to-noise ratio $S/N \sim 70$–100. Information concerning the program stars and their CCD spectra is given in Table 2.

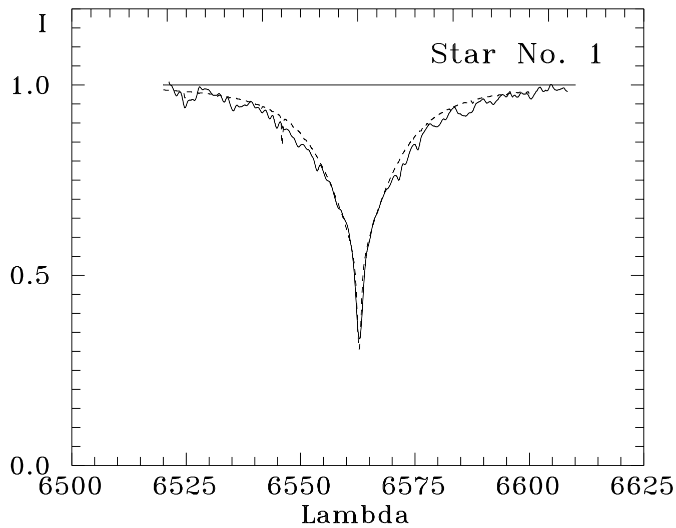

Fig. 1. The H_α line profile for star No. 1 (1921). The best fit between the synthetic and observed profiles is presented.

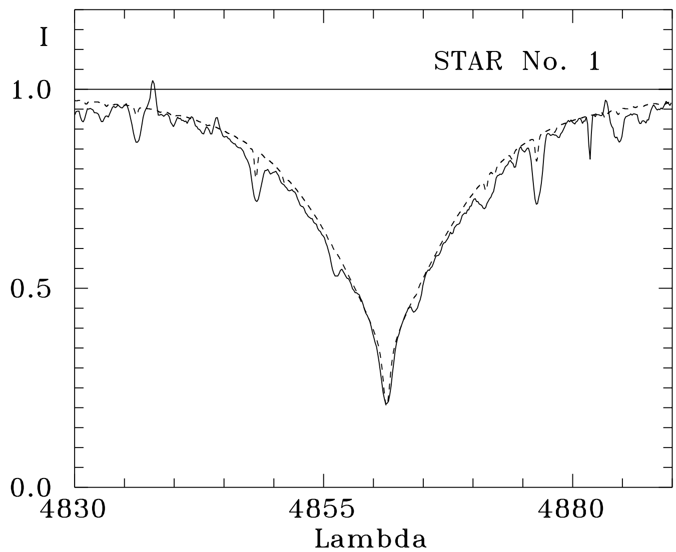

Fig. 2. The H_β line profile for star No. 1 (1921). The best fit between the synthetic and observed profiles is presented.

By means of the MIDAS software, we extracted the spectra from CCD frames, subtracted dark frames, removed cosmic ray hits, and performed wavelength calibration. All the equivalent widths W_λ values were measured using the DECH20 code (Galazutdinov 1992).

Similarly to Paper I, prior to the calculations we made a visual inspection of the program B-stars spectra, because star No. 1 was suspected to be a peculiar shell star, and No. 111 has a high projected rotational velocity. The H_α and H_β line profiles for star No. 1 are shown in Figs. 1 and 2, respectively. As seen in the figures, there are no emission features in the H_α and H_β line wings. Hence, star No. 1 is not a shell star.

On the other hand, star No. 111 is an usual MS object with the high projected rotational velocity (see Figs. 3 and 4).

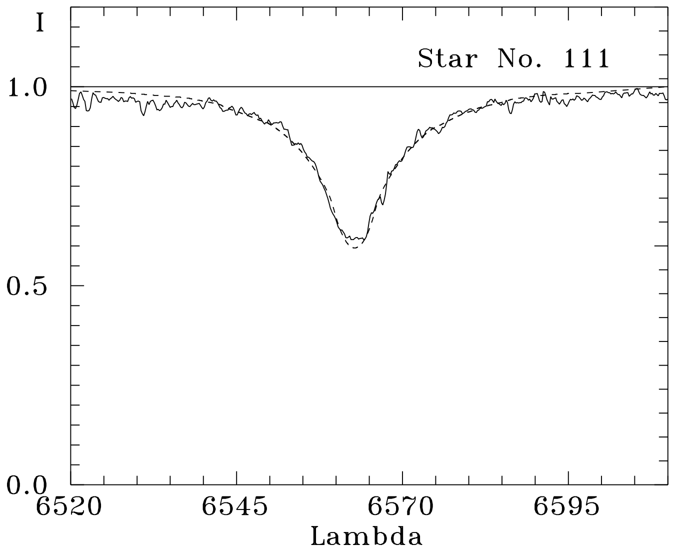

Fig. 3. The same as Fig. 1 for star No. 111 (1600).

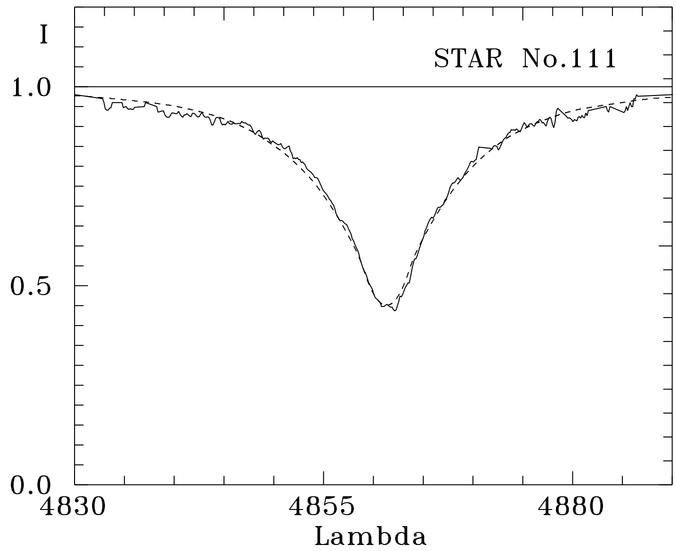

Fig. 4. The same as Fig. 2 for star No. 111 (1600).

As noted from the figures, prior to making equivalent width measurements, we estimated values of $v \sin i$ for each B-star. For that we used a synthetic spectrum technique (STARSP code of Tsymbal 1996) software and SYNSPEC code (Hubeny et al. 1994), fitting a synthetic spectrum to the observed one. The results are given in Table 3. In our analysis, we did not use lines with equivalent widths greater than 150 mÅ.

The internal accuracy of the equivalent widths is of the order of 5–10%. This estimate is based upon a comparison of the values derived from the lines present in two overlapping spectral orders.

The method of analysis implemented in this work was described by us in detail in Paper I. We used atmosphere models, interpolated from the Kurucz (1992) grid along with the WIDTH9 code for calculating the chemical composition.

For V1726 Cyg, as for SU Cas in Paper I, we used so-called "solar" $\log gf$ values derived by us using unblended solar lines (from the solar spectrum by Kurucz et al. 1984). The corresponding solar atmosphere model was recalculated with $V_t = 1$ km s^{-1} from Kurucz's grid, using the WIDTH9 code. For the B-stars we used the oscillator strengths from the Kurucz (1995) database (CD-ROM 15, 18). Solar elemental abundances were taken from Grevesse & Noels (1993) (see Paper I).

4. Atmospheric parameters and chemical composition

4.1. Atmospheric parameters

As in Paper I, program objects with different spectral types and luminosity classes require the determination of atmospheric parameters by different methods. For V1726 Cyg we obtained values for the effective temperature ($T_{\rm eff}$), surface gravity ($\log g$), and microturbulent velocity (V_t) as follows.

1) $T_{\rm eff}$ was found using the ratio of the depths of spectral lines by the method of Kovtyukh & Gorlova (2000) with an accuracy of ±50–80 K.

2) The surface gravity was determined by forcing the Fe I and Fe II to produce the same abundance (within an accuracy of about ±0.20 dex).

3) V_t was obtained by forcing the abundances from the Fe II lines to be independent of the equivalent widths (with an accuracy of about ±0.30 km s^{-1}).

For the B-stars we used:

1) $(U-B), (B-V) \sim T_{\rm eff}$, $\log g$ calibrations (Bessel et al. 1998).

2) Comparisons of the observed H_α and H_β line profiles with synthetically generated ones.

The $(B-V)$ and E_{B-V} data were taken from Turner et al. (1994).

All data for the preliminary $T_{\rm eff}$ and $\log g$ values determination for B-stars are given in Table 3.

For the V_t determination in the case of star No. 1, we used the same method, as adopted for V1726 Cyg. For star No. 111 we adopted a value of V_t of 3 km s^{-1}, which seems more appropriate for late B-stars. All of the adopted atmospheric parameters are listed in Table 4.

4.2. Abundances for the Platais 1 members

In Tables 5 and 6 we list the calculated abundances for V1726 Cyg and star No. 1, respectively. For the rapidly rotating B-star No. 111 (as with HD 17443 from Paper I) we estimated only the helium and magnesium abundances using two strong features He I 4471 Å and Mg II 4481 Å. That was done using spectral synthesis (see Fig. 5). The helium and magnesium abundances turn out to be solar.

From an analysis of the results of Tables 5 and 6, we notice that DCEPS V1726 Cyg and B-star No. 1 have chemical compositions very similar to those of DCEPS SU Cas and HD 17327a in the Cas OB2 association

Table 3. $T_{\rm eff}$ and $\log g$ determination for B–stars.

Star	$T_{\rm eff}$				$\log g$			$v \sin i$
	$(B-V)_0$	$(U-B)_0$	H_α	H_β	$(B-V)_0$, $(U-B)_0$	H_α	H_β	(km s^{-1})
No. 1 (1921)	9900	9900	10 000	10 000	3.30	3.50	3.50	10
No. 111 (1600)	12 250	14 000	13 000	13 000	4.00	4.00	4.00	150

Table 4. Adopted atmospheric parameters.

Star	$T_{\rm eff}$	$\log g$	$V_{\rm t}$
V1726 Cyg	6275	2.30	4.20
No. 1 (1921)	10 000	3.50	3.50
No. 111 (1600)	13 000	4.00	3.00

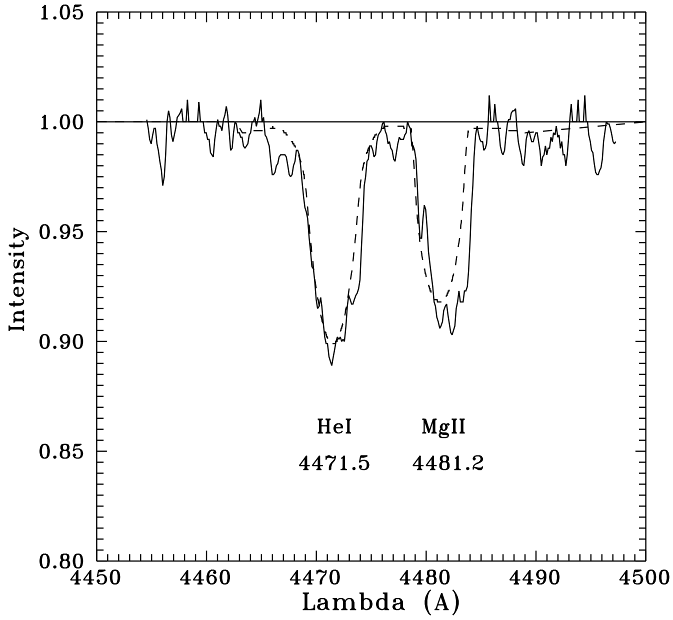

Fig. 5. The fit between the observed and synthetic spectra for star No. 111 (1600) near the He I 4471 Å and Mg II 4481 Å lines.

(Paper I), respectively. The weighted average metallicity for V1726 Cyg [Fe/H] = +0.05 and [Fe/H] = +0.13 for Star No. 1. These values are close to that of the Sun. Indeed, V1726 Cyg appears to be carbon deficient, with a very noticeable overabundance of nitrogen, and the oxygen content close to solar. Data for so-called "odd elements", sodium and aluminium, suggest a small overabundance for the first element and a solar-like content for the second. As with SU Cas, the content of α-elements (except for the magnesium deficit) is close to solar. The Fe-group elements have a slight overabundance, however except for manganese and nickel. The abundances of s-process elements are close to solar, and exhibit some overabundance (see Fig. 6).

It is interesting that star No. 1 is a mercury-manganese star, much like HD 17327a in Paper I. It has an overabundance of helium, carbon and oxygen, and a deficient of nitrogen. Furthermore, there is a deficit of Mg and Si, and an overabundance of P, Sc, Mn, Y, Zr and Hg. The latter are distinctive features of this type of peculiar

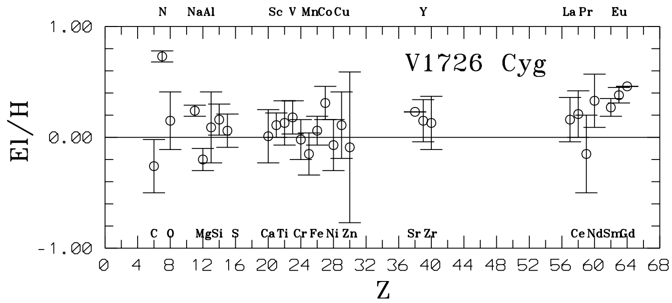

Fig. 6. Elemental abundance for V1726 Cyg.

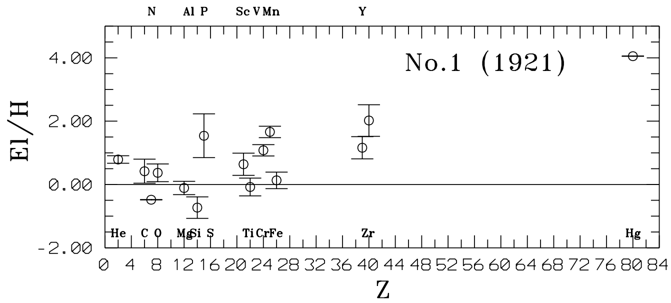

Fig. 7. Elemental abundance for star No. 1 (1921).

B-star (see Fig. 7). Nevertheless, star No. 1 is located in the log(Mn/Fe) ~ log(Fe/H) diagram (Ryabchikova 1997) between the classical HgMn star region and the Searl-Sargent group (see Fig. 8). According to its value of $T_{\rm eff}$, the object seems to be closer to the Searl-Sargent group, whereas HD 17327a is a classical HgMn star.

In Paper I we noted that the HgMn-star HD 17327a, unlike the main-sequence B star HD 17443, has an overabundance of helium. That fact was interpreted to be the result of the light-induced drift (LID) mechanism (Atutov & Shalagin 1988). For star No. 1 we obtain the same result, while star No. 111 has a helium content close to solar.

5. Colour excesses

As seen from Table 4, our values of $T_{\rm eff}$ and $\log g$ obtained spectroscopically for stars Nos. 1 and 111 give corresponding values for $(B-V)_0$ of $-0\overset{\rm m}{.}087$ and $-0\overset{\rm m}{.}120$, respectively, according to a $(B-V) \sim (T_{\rm eff}, \log g)$ calibration from Bessell et al. (1998). There is excellent agreement between our results and those of Turner et al. (1994) (see Table 5 from their paper). Their colour excesses E_{B-V}($0\overset{\rm m}{.}37$ and $0\overset{\rm m}{.}48$, respectively), derived for those stars using UBV photometry, are therefore very accurate.

For V1726 Cyg Turner et al. (1994) estimated $E_{B-V} = 0\overset{\rm m}{.}43 \pm 0\overset{\rm m}{.}02$. That value for the reddening corresponds

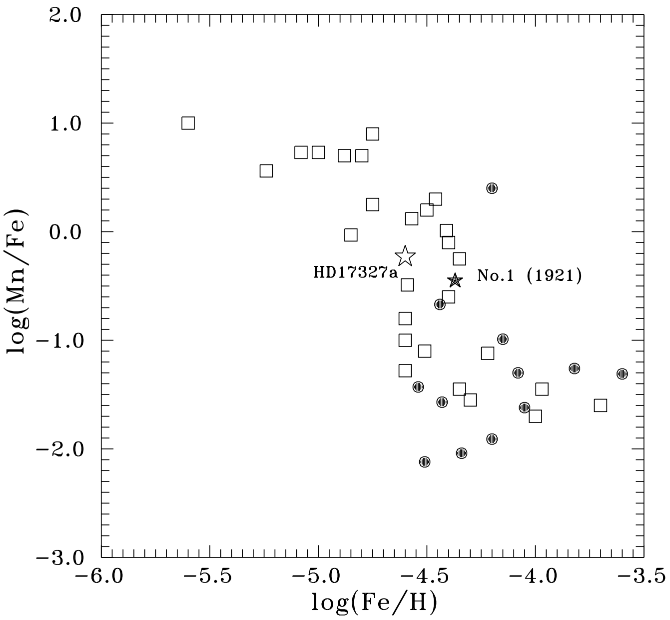

Fig. 8. log(Mn/Fe) vs. log(Fe/H) abundances relation. Open squares, – classical (SB1) HgMn stars, filled circles, – Searle-Sargent (SB2) group HgMn stars; the open star indicate HD 17327a, while the filled star, – No. 1 (1921).

to an intrinsic colour-index of $(B-V)_0 = 0\overset{\mathrm{m}}{.}46 \pm 0\overset{\mathrm{m}}{.}02$. For the mean cluster distance of $d = 1568 \pm 13$ pc, the corresponding absolute magnitude for V1726 Cyg is $M_V = -3\overset{\mathrm{m}}{.}42 \pm 0\overset{\mathrm{m}}{.}07$ which suggest pulsation is in the *first* overtone.

To check that suggestion, we estimated a corresponding intrinsic colour for $T_{\rm eff} = 6275$ K and $\log g = 2.3$ ($\phi = 0\overset{\mathrm{p}}{.}11$) from the average standard light and colour curves (Berdnikov & Pastukhova 1994), as interpolated from the $(B-V) \sim (T_{\rm eff}, \log g)$ calibration, cited above. We obtained $(B-V)_0 = 0\overset{\mathrm{m}}{.}485$, which corresponds to a colour excess of $E_{B-V} = 0\overset{\mathrm{m}}{.}34$. If the value of $E_{B-V} = 0\overset{\mathrm{m}}{.}43 \pm 0\overset{\mathrm{m}}{.}02$ from Turner et al. (1994) is correct, than the corresponding intrinsic colour-index $(B-V)_0 = 0\overset{\mathrm{m}}{.}392$, bluer by $0\overset{\mathrm{m}}{.}093$ than our estimation. Having noted that Turner et al. (1994) explained the same difference of $\sim 0\overset{\mathrm{m}}{.}09$ between the average $(B-V)_0 = 0\overset{\mathrm{m}}{.}46$ for this DCEPS and those of the most Cepheids with similar periods as a consequence of pulsation in the first overtone, we can assume that V1726 Cyg is pulsating in the *fundamental* tone.

It is interesting to check our spectroscopic value of $T_{\rm eff}$ with ones obtained from Gray's (1992) $(B-V) \sim T_{\rm eff}$ relationship:

$$\begin{aligned}\log T_{\rm eff} \;=\; & 3.988 - 0.881(B-V) + 2.142(B-V)^2 \\ & -3.614(B-V)^3 + .2637(B-V)^4 \\ & -1.4727(B-V)^5 + 0.2600(B-V)^6. \end{aligned} \qquad (1)$$

In the case of the value given by Turner et al. (1994) ($(B-V)_0 = 0\overset{\mathrm{m}}{.}392$) we obtained $T_{\rm eff} = 6577$ K, while our $(B-V)_0 = 0\overset{\mathrm{m}}{.}485$ gives 6280 K. The last estimate is in excellent agreement with the spectroscopic value.

Table 5. Elemental abundance for DCEPS V1726 Cyg.

Element	[El/H]	σ	NL
C I	−0.26	0.24	10
N I	+0.73	0.05	2
O I	+0.15	0.26	4
Na I	+0.24	0.05	2
Mg I	−0.20	0.10	3
Al I	+0.09	0.32	3
Si I	+0.12	0.14	30
Si II	+0.20	–	1
S I	+0.06	0.15	3
Ca I	+0.01	0.24	13
Sc II	+0.11	0.11	8
Ti I	+0.11	0.23	29
Ti II	+0.14	0.07	9
V I	+0.21	0.15	5
V II	+0.14	0.12	3
Cr I	−0.08	0.24	18
Cr II	+0.05	0.13	9
Mn I	−0.15	0.19	13
Fe I	+0.05	0.13	119
Fe II	+0.07	0.12	24
Co I	+0.31	0.15	8
Ni I	−0.07	0.23	63
Cu I	+0.11	0.30	3
Zn I	−0.09	0.68	4
Sr I	+0.23	–	1
Y II	+0.15	0.19	6
Zr II	+0.13	0.24	5
La II	+0.16	0.20	4
Ce II	+0.21	0.21	10
Pr II	−0.15	0.35	2
Nd II	+0.33	0.24	3
Sm II	+0.27	0.08	3
Eu II	+0.38	0.07	2
Gd II	+0.46	–	1

NL – number of lines.

The colour excess estimated by us for V1726 Cyg is therefore closer to that for star No. 1 which is located 1 arcmin east of the variable. In principle all three values are close to the mean reddening of $E_{B-V} = 0\overset{\mathrm{m}}{.}39$ obtained by Turner et al. (1994) for the open cluster Platais 1. On that basis, we may use their mean values of $R = A_V/E_{B-V} = 3.07$ and $d = 1568 \pm 13$ pc.

6. Luminosities, radii and masses

To estimate luminosities and radii of the program objects we can use our spectroscopic $T_{\rm eff}$ with the mean distance from Turner et al. (1994). For the B-stars we used bolometric corrections from Bessel et al. (1998). However, for V1726 Cyg we have one spectrogram only. We therefore estimated the mean value of $T_{\rm eff} = 6100$ K with $\log g = 2.35 \pm 0.05$ interpolated from the $(B-V) \sim (T_{\rm eff}, \log g)$ calibration of Bessell et al. (1998), using the averaged standard $(B-V)_0$ colour curve (Berdnikov & Pastukhova 1994) with the mean value of $(B-V)_0 = 0\overset{\mathrm{m}}{.}553$.

Table 6. Elemental abundance for star No. 1 (1921).

Element	[El/H]	σ	NL
He I	+0.79	0.12	2
C I	+0.42	0.38	2
N I	−0.48	0.00	1
O I	+0.37	0.28	4
Mg I	−0.35	0.21	3
Mg II	+0.24	0.00	1
Si II	−0.73	0.34	5
P II	+1.54	0.69	2
Sc II	+0.64	0.35	2
Ti II	−0.08	0.28	10
Cr II	+1.08	0.18	10
Mn I	+1.65	0.00	1
Mn II	+1.66	0.18	12
Fe II	+0.13	0.26	23
Y II	+1.16	0.35	3
Zr II	+2.02	0.50	2
Hg I	+4.05	0.00	1

NL – number of lines.

Table 7. Luminosities, radii and masses for the Platais 1 members.

Star	M_V	$M_{\rm bol}$	$\log(L/L_\odot)$	$R/R_\odot$	$M_{\rm ev}$
V1726 Cyg (F)	−2.99	−2.99	3.10	31.8	4.2
V1726 Cyg (1st)	−3.42	−3.42	3.28	38.6	4.8
No. 1 (1921)	−0.97	−1.23	2.40	5.3	3.0
No. 111 (1600)	+0.08	−0.76	2.21	2.5	3.0

F – fundamental mode.
1st – first overtone.

Equation (1) gives a mean value of $T_{\rm eff} = 6124$ K, which is very close to the estimate mentioned above.

L and R estimates have been obtained for each star (see Table 7) using these values for $T_{\rm eff}$ and A_V along with the cluster distance and the value of $M_{\rm bol}$. Since V1726 Cyg is an object in the post red supergiant evolutionary phase, its evolutionary mass has been obtained from the mass–luminosity relation obtained from stellar evolutionary models that include core overshooting,

$$\log(L/L_\odot) = 3.52 \log(M/M_\odot) + 0.9 \quad (2)$$

(Chiosi et al. 1992; Antonello & Morelli 1996). For this DCEPS we display its parameters for cases of fundamental mode and first overtone pulsations. For the other objects the evolutionary masses were obtained as in Paper I, from their positions in the HR diagram relative to evolutionary tracks from Shaller et al. (1992) (see Table 7). All such evolutionary tracks and the positions of the Platais 1 members in the HR diagram are shown in Fig. 9.

7. Ages

It is interesting to estimate ages for the Platais 1 objects. From the Schaller et al. (1992) grids of models we obtain age estimates of 1.5×10^8, 2.49×10^8 and 3.22×10^8 yrs for V1726 Cyg, star No. 1 and star No. 111, respectively.

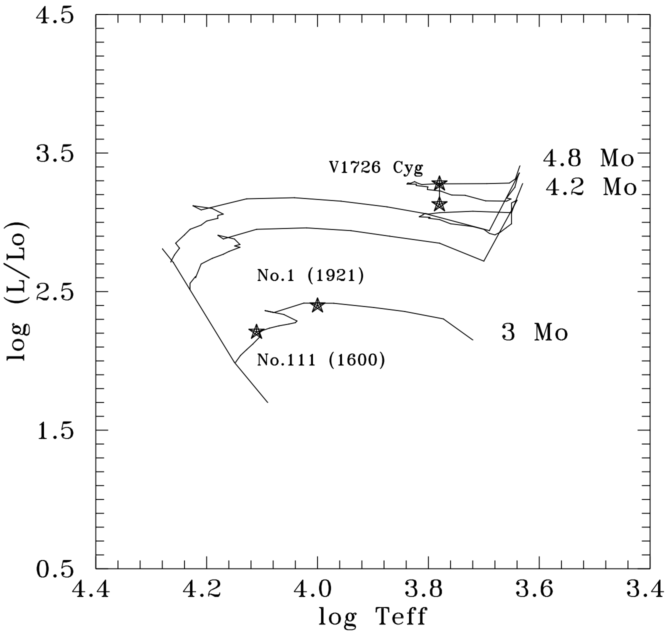

Fig. 9. HR diagram for Platais 1 members. Evolutionary tracks are from Schaller et al. (1992) recalculated for $Z = 0.02$.

Turner et al. (1994) estimated the age of this open cluster to be about 1.1–1.9×10^8 yr, like that of the open cluster NGC 1647. If star No. 1 lies near the turn-off point of the open cluster, then an age of about 2.5×10^8 can be adopted.

8. Conclusions

We can summarize the results of our detailed high-resolution spectroscopic investigation:

1) All Platais 1 objects studied have metallicities close to that of the Sun.

2) The values of $T_{\rm eff}$ and $\log g$ derived spectroscopically for the two B-stars in this open cluster are in excellent agreement with ones determined from the Turner et al. (1994) $(B-V)$ colour-indices in conjunction with a $(B-V) \sim (T_{\rm eff}, \log g)$ calibration. That implies that the mean values of $E_{B-V} = 0\overset{\rm m}{.}39$ and distance $d = 1568 \pm 13$ pc found by Turner et al. (1994), can be considered to be correct.

3) The DCEPS V1726 Cyg is found to be a Cepheid in the post first dredge-up stage. In spite of having only one spectrogram for the star obtained at phase $\phi = 0\overset{\rm p}{.}11$, we estimated a corresponding intrinsic colour-index near $0\overset{\rm m}{.}485$ and obtain a value for the colour excess $E_{B-V} = 0\overset{\rm m}{.}33$. Because we used an average standard $(B-V)_0$ colour curve, the mean values of $T_{\rm eff} = 6100$ K and $\log g = 2.35 \pm 0.05$ have been obtained carefully. The derived interstellar extinction of $A_V = 1\overset{\rm m}{.}02$ implies an absolute magnitude of $M_V = -2\overset{\rm m}{.}99$ for the Cepheid. In contrast with the value of $M_V = -3\overset{\rm m}{.}42$ from Turner et al. (1994) (indicating pulsation in the *first* overtone), our value is in excellent agreement with that for

pulsation in the *fundamental* mode according to Turner's (1992) $(B-V)_0 \sim M_V$ relation.

It should be noted that Turner et al. (1994) obtained a mean value of $(B-V)_0 = 0\overset{m}{.}46 \pm 0\overset{m}{.}02$, using the intrinsic colour calibrations for *F–G* – supergiants from Fernie (1963), Johnson (1966), Parsons (1971) and Kron (1978). Therefore, either those calibrations are incorrect or V1726 Cyg has a blue companion of approximate spectral type B5–B6V (note that V1726 Cyg is bluer by $\sim 0\overset{m}{.}09$ than most Cepheids with periods near $4\overset{d}{.}24$, according to Turner et al. 1994).

As seen from Fig. 9, the Cepheid V1726 Cyg is located in the HR diagram between portions of the evolutionary tracks for stars with $M_{\rm ev} = 4.2\ M_{\odot}$ and $4.8\ M_{\odot}$ for the case of fundamental mode and first overtone pulsations, respectively. Both positions correspond to the *third* crossing of the Cepheids instability strip. That feature has a realistic observational confirmation, namely an increasing pulsational period corresponds to movement towards the red edge of Cepheids instability strip (Berdnikov et al. 2000; Turner et al. 1999; Turner et al. 2001). Moreover, Turner et al. (2001) have concluded that it is crossing the Cepheids instability strip for the *third* time.

Nevertheless, since we obtained only one spectrogram for V1726 Cyg, we cannot contend flatly that this DCEPS is pulsating in the *fundamental* mode. According to Turner et al. (2001), its light curve's Fourier parameters correspond with those found for Cepheids pulsating in the *first* overtone. In our opinion, this DCEPS is in need of more detail spectroscopical investigations. It is necessary to obtain more specific information about the mean effective temperature, gravity and radius of the star. Such data could help clarify the identification of the V1726 Cyg pulsational mode.

4) The two B-stars from Platais 1 have approximately equal evolutionary masses of $\sim 3\ M_{\odot}$. It is interesting that star No. 111, like HD 17443 in Cas OB2, is a typical MS star with a high rotational velocity and has a helium content comparable to that of the Sun. Star No. 1 appears to be a HgMn-star with an overabundance of He, C, O, P, Sc, Mn, Y, Zr, Hg and a deficiency of N, Al, Mg, and Si. That can be well explained by the LID mechanism operating in the stellar atmosphere. Much like HD 17327a in Cas OB2, the star lies near the turn-off point of the cluster and is a more evolved object than star No. 111. Unlike HD 17327a, however, star No. 1 probably belongs to the Searl-Sargent group.

5) The age of the open cluster was estimated to be about 2.5×10^8 yrs, while that of the Cepheid is 1.5×10^8 yrs.

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